FAA Aviation News
AVIATION SAFETY FROM COVER TO COVER
SEPTEMBER/OCTOBER 2004

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FRONT COVER: It's Balloon Fiesta time in Albuquerque, NM. (Mario Toscano photo)

BACK COVER: Reno Air Races (H. Dean Chamberlain photo)

Sport Pilot and Light-sport Aircraft Rule

On July 16, FAA Administrator Marion C. Blakey signed the Sport Pilot and Light-sport Aircraft Rule. It went into effect on September 1, 2004. To help our readers to understand the rule, the FAA Aviation News *plans to publish an on going questions and answers (Q & A) column about the rule beginning with this issue. The following expanded feature and the reprinted article for* AMT *magazine will give an overview of the rule.*

What happened on September 1, 2004, the effective date of the Sport pilot and Light-sport Aircraft final rule?

Any FAA certificated aircraft that meets the Title 14 Code of Federal Regulations (14 CFR) part 1 definition of a "light-sport aircraft" may be operated by an FAA certificated pilot ***exercising*** sport pilot privileges. This aircraft is ***not*** re-certified as an experimental or special light-sport aircraft. The light-sport aircraft retains the current airworthiness certificate issued and must be operated, maintained, and inspected, as applicable. Some examples are a standard category aircraft (e.g., J-3 *Cub, Aeronca*); experimental amateur-built (e.g., *Kit-Fox, Rans*); primary category (e.g., *Quicksilver*), etc.

Any FAA certificated pilot who holds at least a valid third class medical *or* a current and valid U.S. driver's license may ***exercise*** sport pilot privileges under the pilot's current pilot certificate. The pilot:

- Must have a current flight review;
- Must be qualified in the specific category and class (ratings on the recreational certificate or higher);
- Must meet the currency requirements, three take-offs and landings, if a carrying a passenger; and
- Must have the cross-country training requirements of 14 CFR §61.101(c), if a recreational pilot.

An FAA certificated pilot may ***not*** use a current and valid U.S. driver's license to meet the medical eligibility requirements if ***any*** of the following conditions apply:

- Must not have been denied the most recent application for a medical certificate (if the pilot has applied for medical certificate);
- Must not have had the most recently issued medical certificate suspended or revoked (if the pilot has been issued a medical certificate); or
- Must not have had the most recent authorization for a special issuance of a medical certificate withdrawn (a special issuance is not a denial).

Additionally, the FAA certificated pilot must:

- Comply with each restriction and limitation imposed on his or her driver's license;
- Comply with any judicial or administrative order applying to the operation of a motor vehicle; and
- Not know or have reason to know of any medical condition that would make that person unable to operate a light-sport aircraft in a safe manner.

An FAA certificated pilot who has had his or her medical certificate suspended, revoked, denied, or special issuance of a medical certificate withdrawn, ***may reapply*** for at least a third class medical at any time. Once reissued a current medical certificate, the pilot has ***cleared*** his or her medical record and may use a current and valid U.S. driver's license in lieu of the third class medical. (At that time, the pilot can let the medical or special issuance lapse.)

Any FAA certificated pilot who knows or has reason to know of any medical condition that would make the pilot unable to operate a light-sport aircraft in a safe manner cannot exercise sport pilot privileges. This is the age-old question all pilots must ask themselves before acting as PIC of any aircraft on any given day. If you can't answer this

Flight Standards Service Director Jim Ballough (L) listens to the Deputy Director of the Aircraft Certification Service, Ron Wojnar, explain certification procedures in the new light-sport aircraft rule as FAA Administrator Marion C. Blakey looks on. The three were explaining and answering questions as part of their briefing to the media on the new rule.

question, consult your personal physician.

What privileges and limitations must be complied with when a pilot is exercising sport pilot privileges?

A sport pilot may share the operating expenses of a flight with a passenger, provided the expenses involve only fuel, oil, airport expenses, or aircraft rental fees. You must pay at least half the operating expenses of the flight.

You may not act as pilot in command of a light-sport aircraft:

- That is carrying a passenger or property for compensation or hire.
- For compensation or hire.
- In furtherance of a business.
- While carrying more than one passenger.
- At night.
- In Class A airspace.
- In Class B, C, and D airspace, at an airport located in Class B, C, or D airspace, and to, from, through, or at an airport having an operational control tower, unless you have met the requirements specified in 14 CFR §61.325.
- Outside the United States, unless you have prior authorization from the country in which you seek to operate. Your sport pilot certificate carries the limitation "Holder does not meet ICAO requirements."
- To demonstrate the aircraft in flight to a prospective buyer, if you are an aircraft salesperson.
- In a passenger-carrying airlift sponsored by a charitable organization.
- At an altitude of more than 10,000 feet MSL.
- When the flight or surface visibility is less than three statute miles.
- Without visual reference to the surface.
- If the aircraft has a V_H that exceeds 87 knots CAS, unless you have met the requirements of §61.327.
- Contrary to any operating limitation placed on the airworthiness certificate of the aircraft being flown.
- Contrary to any limit or endorsement on your pilot certificate, airman medical certificate, or any other limit or endorsement from an authorized instructor.
- Contrary to any restriction or limitation on your U.S. driver's license or any restriction or limitation imposed

by judicial or administrative order when using your driver's license to satisfy a requirement of this part.
- While towing any object.
- As a pilot flight crewmember on any aircraft for which more than one pilot is required by the type certificate of the aircraft or the regulations under which the flight is conducted.

What is the definition of a light-sport aircraft?

Light-sport aircraft means an aircraft, other than a helicopter or powered-lift that, since its original certification, has continued to meet the following:

- A maximum takeoff weight of not more than—
  - ◊ 660 pounds (300 kilograms) for lighter-than-air aircraft;
  - ◊ 1,320 pounds (600 kilograms) for aircraft not intended for operation on water; or
  - ◊ 1,430 pounds (650 kilograms) for an aircraft intended for operation on water.
- A maximum airspeed in level flight with maximum continuous power (V_H) of not more than 120 knots CAS under standard atmospheric conditions at sea level.
- A maximum never-exceed speed (V_{NE}) of not more than 120 knots CAS for a glider.
- A maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity.
- A maximum seating capacity of no more than two persons, including the pilot.
- A single, reciprocating engine, if powered.
- A fixed or ground-adjustable propeller, if a powered aircraft other than a powered glider.
- A fixed or autofeathering propeller, system, if a powered glider.
- A fixed-pitch, semi-rigid, teetering, two-blade rotor system, if a gyroplane.
- A nonpressurized cabin, if equipped with a cabin.
- Fixed landing gear, except for an aircraft intended for operation on water or a glider.
- Fixed or repositionable landing gear, or a hull, for an aircraft intended for operation on water.
- Fixed or retractable landing gear for a glider.

When will the FAA be ready to begin accepting applications and issuing new airman certificates or new airworthiness certificates under this rule?

Airman:

January 2005 – Beginning January 15, 2005, the FAA will accept certificate applications. Use FAA Form 8710-11 for a student pilot seeking a sport pilot certificate or flight instructor certificate with a sport pilot rating and FAA Form 8610-1 for a repairman (light-sport aircraft) certificate. Additionally, the FAA will begin processing FAA Form 8710-11 applications for additional sport pilot or sport pilot CFI category or class privileges.

FAA Form 8710-11applications for the new private pilot certificates with a weight-shift control or powered parachute ratings will also be accepted after this date.

The new FAA Form 8710-11, Airman Application and/or Rating – Sport Pilot, will not be made public until January 15, 2005.

FAA Form 8610-1 is currently available, but the policy for the repairman (light-sport aircraft) to complete the application is not. The FAA will not accept any applications for this new repairman certificate that are submitted prior to this date.

Aircraft:

October 2004 – Beginning October 15, 2004, the FAA will accept AC Form 8050-1, Aircraft Registration Form and FAA Form 8050-88A, Affidavit Of Ownership, to register the transitioning ultralight-like aircraft and two-place training vehicles that have never been certificated, *[Experimental Light-sport Aircraft (ELSA) under the provisions of 14 CFR §21.191(i)(1)]*, the new kit-built light-sport aircraft *[ELSA under the provisions of 14 CFR §21.191(i)(2)]*, or the newly manufactured light-sport aircraft that will meet the consensus standards *[Special Light-sport Aircraft (SLSA) under the provisions of 14 CFR §21.190]*

January 2005 – Beginning January 15, 2005, the FAA will accept FAA Form 8130-6, Application for U.S. Airworthiness Certificate for the issuance of an experimental light-sport airworthiness certificate or a special light-sport airworthiness certificate.

What are the milestones for implementation of the final rule?

The FAA will post an implementation plan for the rule on the FAA Sport Pilot and Light-Sport Aircraft web site using, <http://www.faa.gov/avr/afs/ sportpilot> or <http://AFS600.faa.gov>. The plan will contain milestones for completion of the specific guidance, policy, and infrastructure necessary for the public to conduct operations and seek certification under the new regulations. Some of the major milestones are:

September 1, 2004 — Effective Date of Rule

- An FAA certificated pilot can exercise sport pilot privileges while operating an FAA-certificated aircraft that meets the definition of a light-sport aircraft. That pilot can use either a valid third class medical *or* a current and valid U.S. driver's license to meet the medical eligibility requirements.

October 2004

- Unregistered/un-certificated transitioning ultralight-like aircraft can apply for an "N" number (aircraft registration).
- Practical test standards and knowledge tests available to the public.
- Guidelines for repairman training available to the public.
- Designated Pilot Examiner (DPE) and Designated Airworthiness Representative (DAR) applications will be accepted by FAA.

November 2004

- First FAA DAR training course

January 2005

- FAA ready to issue:
  - ◊ First Sport Pilot Certificate
  - ◊ First Sport Pilot CFI Certificate
  - ◊ First Private Pilot-Weight Shift-Control and Powered Parachute ratings
  - ◊ Accept applications for additional category and class privileges
  - ◊ First Experimental Light-sport Certificate
  - ◊ First Special Light-sport Aircraft Certificate
  - ◊ First Light-sport Repairman Certificate
  - ◊ First FAA Designated Pilot Examiner Training Course

February 2005 and beyond

- DAR and DPE courses as needed.
- Education focusing on Sport Pilot Flight Instructor privileges and responsibilities; registering and maintaining light-sport aircraft.

Where can I get additional information about the sport pilot and light-sport aircraft final rule?

FAA Sport Pilot web site is available for more information on the final rule. The URL is <www.faa.gov/avr/afs/sportpilot>. This site addresses the following areas (Links on the left blue menu bar):

- Overview of final rule (Brief summary answers with links to the applicable regulation)
- FAQ's (Questions link to brief summary answers. Each answer links to the applicable regulation. The URL is <www.faa.gov/avr/afs/sportpilot/faq.doc>)
  - ◊ Medical FAQ's (Excellent source for answers to common medical questions)?
- Final rule and Notice of Proposed Rulemaking
- Guidance and policy links (AFS-610 Light Sport Aviation Branch will provide direct links to new policy, guidance materials, and implementation timelines)
- Industry web sites links (Industry organizations that are providing good guidance materials and tools for the general public)

The Light Sport Aviation Branch, AFS-610, has a web site posting information on implementation. The web site can be found at <http://afs600.faa.gov>.

- FAA Forms
- Policy
- Advisory Circulars
- Industry Links

Who do I contact if I have questions on the implementation of the sport pilot and light-sport aircraft rule?

The mailing address and telephone number for the Light Sport Aviation Branch (AFS-610) is:

Light Sport Aviation Branch, AFS-610
PO Box 25082
Oklahoma City OK, 73125
(405) 954-6400

Light Sport Aviation Branch (AFS-610) will answer questions via email at <afs610-comments@faa.gov>.

For questions on **aircraft certification** contact the Small Airplane Directorate (ACE-100) at (816) 329-2464; fax (816) 329-4090; e-mail <9-ACE-AVR-SPORTPILOT-QUESTIONS@faa.gov>. ✣

Mario Toscano photo

FAA Administrator Marion C. Blakey (seated in a light-sport airplane), EAA President Tom Poberezny, and FAA Safety Inspector Sue Gardner stop for a moment for a photograph while touring a display of light-sport aircraft at FAA Headquarters. The three were instrumental in the new light-sport rulemaking effort.

Light Sport Repairman

EAA photo by Jim Koepnik

by Bill O'Brien

On July 16, 2004, FAA Administrator Marion C. Blakey signed the long awaited light-sport aircraft rule. Just for starters, the rule allows for the certification of approximately 14,000 existing light-sport aircraft, 14,000 brand-new pilots, and 14,000 brand-new repairmen.

I am well aware that individual mechanics and maintenance organizations have expressed great interest in this rule's repairman certification and shared with me their honest concerns about the possible negative impact it may have on our profession. So in this article I will attempt to give you a good briefing on the rule requirements and hopefully arrest your fears by calibrating reality.

In order to make some sense of my copy of this 452-page rule, I will be using the old question and answer method that the plain language folks here in Washington are so fond of.

What is a light-sport aircraft?

This new Title 14 Code of Federal Regulations (14 CFR) part 1 definition is a very broad one, and it states that a light-sport aircraft means an aircraft, other than a helicopter or powered-lift that:

1. Weights no more than 1,320 pounds for aircraft not intended for operation on water or 1,430 pounds for an aircraft intended for operation on water.
2. The aircraft must have a maximum airspeed in level flight of not more than 120 knots, and a maximum stalling speed of not more than 45 knots.
3. Seating capacity of no more than two, including the pilot.
4. A single reciprocating engine
5. A fixed or ground adjustable propeller for aircraft other than a powered glider.
6. A fixed or auto-feathering propeller system, if a powered glider.
7. A non-pressurized cabin, if

equipped with a cabin.

8. A fixed landing gear for land operations
9. A fixed or repositionable landing gear or hull for water operations.
10. Fixed or retractable landing gear for a glider.

Now, I know what some of you are thinking. "Hey, O'Brien that definition includes J-3 *Cubs* and Cessna 120s and other light two-place Type Certificate (TC) aircraft. Is this rule going to put us mechanics out of a job?" The answer is no! I made sure in the rule language that TC aircraft and amateur-built certificated aircraft could not "cross over" and be certificated in light-sport category.

So nothing has changed. Annuals, 14 CFR part 43 performance requirements, and ADs will still apply to the "light-sport" TC aircraft and the annual condition inspection and applicable operating limitations will still apply to amateur-built aircraft, even if they meet the definition of light-sport aircraft in 14 CFR part 1 to a "T."

However, it is true that the rule will allow a properly certificated light-sport pilot to fly a TC light-sport aircraft like a J-3 *Cub* or an amateur-built aircraft like a RV-4.

Again, at the risk of repeating myself, this rule will not affect existing TC and amateur-built aircraft maintenance and certification requirements. There will be no Supplemental Type Certificate (STC) granted to an older Cessna 150s in order to shave off pounds to meet this rule! There will be no exemptions given to TC aircraft in order to meet weight or speed requirements of light-sport aircraft. Furthermore, certificated light-sport repairmen are prohibited from performing maintenance or inspections on a TC or amateur-built aircraft.

How many kinds of light-sport aircraft airworthiness certificates are there?

There are two: experimental, operating light-sport aircraft, and light-sport category aircraft, which is better know as "special." An interesting part of the rule is the term "experimental," operating light-sport aircraft. "Experimental" is not considered a "category," but a "special" light-sport aircraft is considered a category by itself. To add to the confusion, both experimental and special light-sport aircraft are issued a special (pink) airworthiness certificate, FAA Form 8130-7. So if you are about to work on these kinds of aircraft, first check the pink airworthiness certificate and see what kind of light-sport aircraft you are leaning against.

How many "classes" of light-sport aircraft are there?

In experimental, operating light-sport aircraft there are six classes: airplane, glider, lighter-than-air, powered parachute, weight-shift control, and gyroplanes. In "special" light-sport category, there are five classes: airplane, glider, lighter-than-air, powered parachute, and weight-shift control. Gyroplane class was dropped because both FAA and the gyroplane folks estimated that it will take a while to develop a gyroplane consensus standard, so for now they will stay in experimental.

What are the requirements for experimental, operating light-sport aircraft?

The experimental, operating light-sport aircraft airworthiness certificate is designed for pleasure/personal flying only. So the inspection requirements are similar to those inspection requirements for amateur-built aircraft. In other words, both experimental aircraft's operating limitations require the owner to perform an annual condition inspection once a year and comply with their own operating limitations.

Remember, that both the light-sport aircraft and amateur-built rules only speak to inspection, not repairs, alterations, or even preventive maintenance. This is because an "experimental" airworthiness certificate is issued to an aircraft that meets no known FAA-approved design standard. So there is no rule on the books that requires a certificated mechanic or repairman to perform regular old maintenance, repairs, and alterations to a known standard. In fact, anyone can do maintenance on these aircraft because part 43 and part 65 rules do not apply.

But to perform the annual condition "inspection" as identified in the aircraft's airworthiness certificate's operating limitations, that inspection must be performed by an A&P mechanic, or a light-sport repairman, or appropriately rated repair station. The FAA wants a certificated person, once a year, to determine if these experimental aircraft are safe to fly.

What are the requirements for "special" light-sport aircraft?

A "special" light-sport aircraft is also issued a pink or special airworthiness certificate that is issued to an aircraft used for hire, such as for flight training, towing and rental. Because the owner/operator of these aircraft can hold out to the public, a different set of maintenance requirements apply. For example, the aircraft must be maintained to an industry-developed consensus standard as defined in part 1.

This consensus standard includes maintenance and inspection procedures, identification and recording of major repairs and major alterations, and continued airworthiness. In addition, all maintenance performed on "special," light-sport aircraft must be performed in accordance with part 43, with the exception of sections 43.5(b), 43.9(d), Appendix A and Appendix B , which deals with the identification and recording of major repairs and major alterations. That means no Form 337. So why is the Form 337 not used? Well, it's because the light-sport manufacturer's consensus standard is considered acceptable data only, and not approved data like a TC. If you recall, the Regulations 101 course from A&P school taught that the Form 337 documents only "FAA-approved" major repairs and major alterations."

Now lets' rehash the subject a bit more.

First, the light-sport aircraft con-

sensus standard (think type design) is acceptable data only.

Two, light-sport manufacturer is going to identify major repairs and major alteration for its aircraft.

Three, the manufacturer dictates who is qualified to perform major repairs and major alterations to its aircraft and the paperwork goes back to the manufacturer.

So there is nothing left for the FAA to approve. So saying that, since there is no approved data for these aircraft and no description of major repairs or major alterations, now you can see why the Form 337 is not required.

Here's another item that you might find interesting. The rule requires that any Airworthiness Directives (AD) against any FAA-approved product that is installed on these special, light-sport aircraft must be complied with. In addition, any safety directive issued by the aircraft's manufacturer in accordance with the consensus standard must also be complied with. Compared with amateur-built aircraft, the maintenance requirements are tightened up quite a bit for "special" light-sport aircraft.

EAA photo by Jim Koepnik

How many light-sport repairmen certificates are there?

There is only one certificate, repairman light-sport, but there are two ratings: inspection and maintenance. To be eligible, besides completing the required training, an applicant must be 18 years old; a U.S. citizen or a citizen of a foreign country lawfully admitted for permanent residence in the U.S.; and able to read, speak, write and understand English.

What can a light-sport repairman with an inspection rating do?

First off, this certificate is issued only to the owner of an experimental light-sport aircraft. This will allow the owner to perform the annual condition inspection required by his or her aircraft's operating limitations. Each FAA repairman certificate will identify his aircraft's registration number and serial number so he can't cheat and do his buddy's inspection.

What are the requirements to become a light-sport repairman with an inspection rating?

As I mentioned earlier, the experimental, operating light-sport aircraft airworthiness certificate and the amateur-built airworthiness certificate are similar in form and function. But there is a major difference. The owner/operator of an experimental light-sport aircraft did not build 51% of the aircraft like the amateur-built repairman.

So how does the FAA ensure that the owner has the expertise to inspect his or her aircraft and make the determination if it is safe to fly? The answer is the rule requires the owner to get 16 hours of FAA-acceptable training in the class of aircraft that he or she owns.

FAA-accepted training for each of the six eligible classes of light-sport aircraft will focus on to how the repairman is to inspect the aircraft, not how to maintain it. How so? Remember what I said earlier, the operating limitations for these aircraft, requires an annual condition inspection, not maintenance!

Again, I will risk being accused of beating the point to death. Please remember that the 16-hour course will teach an individual how to inspect his/her aircraft only, not perform maintenance. This somewhat odd situation has come to be because there are no TC or any other standards for experimental light-sport aircraft. So anyone can remove and replace parts, and perform repairs and alterations on these aircraft because there is no standard of performance for the maintainer to meet.

Some of you argued that 16 hours is not long enough. Others have commented that the training for this rating is eight hours too long. The bottom line is the rule is signed. To qualify, it requires 16 hours of training on the class of aircraft that is owned by the repairman. If it turns out that the time required to train an individual to a Level 3 performance level of skill is not

right for all or just one particular class of light-sport aircraft, we will change it and make it right.

For your information both the inspection and maintenance rating courses are required to teach to a Level 3 instructional level. This Level 3 requirement is taken from part 147 Appendix A. This appendix a identifies a Level 3 performance as a level where a student can perform the task by demonstrating a high level of skill. In addition, the rule requires that for each rating, each student must pass a written test with a passing grade of 80%.

What can a light-sport repairman with a maintenance rating do?

For starters, this rating is not limited to just one aircraft like the inspection rating. This rating allows the repairman to perform for hire, annual condition inspections on experimental, operating light-sport aircraft and perform maintenance, including the required annual condition inspections on special light sport aircraft. These privileges are limited to the class of aircraft that the repairman has received training on, as identified on his or her FAA repairman certificate.

Under this rating the repairman can work on and sign off manufacturer's safety directives and AD on TC products installed on special light-sport aircraft only. The rating is limited to regular maintenance and preventive maintenance functions and does not authorize the performance of major repairs or major alterations. Why? Because the aircraft's consensus standard requires the manufacturer of the aircraft to determine what is a major repair and major alterations. The same consensus standard requires the manufacturer to determine what additional training is required to perform those tasks to ensure that the repairman is qualified to make those major repairs or alterations.

What kind of training does a light-sport repairman with a maintenance rating need?

The FAA-accepted training is different for each "class" of special light-sport aircraft as follows:

Airplane class	120 hours
Weight-shift class	104 hours
Powered parachute class	104 hours
Lighter-than-air class	80 hours
Glider class	80 hours

Looking at the number of required training hours for a light-sport repairman and comparing it to the 1,900 hours of training that is required to earn an A&P under part 65, the light-sport repairman training requirement almost looks like a joke. But it fell on me to determine the required training hours for light-sport repairmen. It became an apples verses oranges comparison problem.

On the apples side of the argument the A&P is trained to work on a broad spectrum of aircraft ranging from J-3-*Cubs* to B-747-400. This FAA-required training covers hundreds of hours of training on such systems as APU repair and trouble shooting, radial and jet engine overhauls, autopilots, helicopter maintenance, fire suppression systems, controllable pitch propellers, retractable landing gear, deicing and anti-icing systems.

On the oranges side of the argument, the light-sport repairman is trained on one particular "class" of light-sport aircraft whose very name indicates that we are dealing with an aircraft with limited design and performance capabilities.

In addition, the light-sport repairman cannot do major repairs or major alterations, unless the manufacturer determines that he or she has additional training to perform the work, including engine overhauls. So what we have is a repairman who can inspect, troubleshoot, remove, and replace parts on one class of light-sport aircraft, not a fleet of aircraft.

As a bureaucrat, I have to factor into the problem that I am required to meet Title 49, section 44701 of the Code of Federal Regulations. This rule mandates that the FAA to set minimum, not maximum, standards for safety. So listed above are minimum training standards for light-sport repairmen. But, as a mechanic, I know Mr. Murphy's Law oh too well. That is why on page 304 of the preamble language to the light sport rule I added: " FAA may amend the regulations if the numbers of training hours or subjects taught are found insufficient to ensure aviation safety."

Can an A&P perform inspections and maintenance on light-sport aircraft in both experimental and special light-sport category?

The answer is yes. However, please remember that when you are working on special light-sport aircraft, instead of TC data you are held to the aircraft's consensus standard, maintenance manual and instructions for continued airworthiness. Furthermore, on special light-sport aircraft both part 43 and part 65, section 65.81, General privileges and limitations, still apply to A&P mechanics.

To satisfy section 65.81, you need to make sure that you can prove to an FAA inspector that you did the work on the light-sport aircraft before at an earlier date, or been trained to do the work, or was supervised by another mechanic or repairman. If you cannot show that you did at least one of the items listed above you can always take a practical test administered by a FAA inspector to prove your ability to perform the task. If I was you, and I was planning to make some money in this new marketplace, just to be sure, I would take one of the FAA-accepted courses for the class of light-sport aircraft I was interested in.

Because of limitations on the length of this article I did not cover how the training providers for the repairman inspection and maintenance ratings will get their courses "accepted" by the FAA. Nor did I cover the FAA's need for Light-sport Designated Airworthiness Representatives. As soon as the FAA orders on these subjects are signed, I will write an article covering these important subjects.

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Bill O'Brien is an Aviation Saftey Inspector in Flight Standards' Aircraft Maintenance Division. This article originally appeared in AMT *magazine.*

RENO 2004

story and photos by H. Dean Chamberlain

In aviation, certain cities such as Oshkosh, Wisconsin; Lakeland, Florida; and Albuquerque, New Mexico, become the "center of the universe" for their respective aircraft devotees a week or two each year. But whether you love homebuilt/experimental aircraft and go to Lakeland or Oshkosh or go to Albuquerque for balloons, if you love speed and fast aircraft, Reno, Nevada, is your city in September.

Simply said; Reno *is* air racing. If you love the sight and sound of big, unlimited piston-powered aircraft roaring past you or small sleek biplanes and Formula One aircraft darting around telephone pole-sized pylons or brightly colored jets racing down to the finish line, Reno is the place to be from September 16 to 19.

Sponsored by the volunteer, nonprofit Reno Air Racing Association (RARA), the 41st National Championship Air Races & Air Show promises to be another spectacular race and air show. Although RARA has a very detailed Internet web page (www.airrace.org) that has information about the race—past and present, the participants, pilot qualification requirements, racing and safety rules, listing of air show performers, and directions of how to get there—the following highlights information about the races. It includes some of the things general aviation pilots need to know about, if planning on flying to Reno for the races.

Please note, like any aviation event, the information on events, performers, and aircraft is always subject to change.

First, when we say Reno, we must differentiate between the Reno/Tahoe International Airport and Reno-Stead. Reno-Stead is the home of the National Championship Air Races and Air Show, and it is located north of the City of Reno. Reno-Stead was a former military airbase that was transferred to the city in the 1960's.

Located in a wide, high-desert valley, Reno-Stead is the perfect location for air racing. The area is large enough to have the different sized racecourses needed for the six classes of aircraft laid out around the airfield with room to spare. Those classes for 2004 are Biplanes and Formula One aircraft competing on the 3.11-mile course; Sport aircraft on the 6.39-mile course; T-6 aircraft on the 4.99-mile course; and the Jet, L-39 *Albatros* aircraft, and Unlimited Class aircraft on the 8.355 mile-course.

Although the rules for the races are detailed and have severe penalties for serious infractions and pilot proficiency requirements exclude most of us from competing without the prerequisite skills and training, from a spectator's perspective, if you have never been to an air race, the course rules can be summarized with the following example.

In the July-August 2003 issue of this magazine, we told about an engraved cockpit placard Cris Ferguson

of Evanville, Arkansas, had in his aircraft at the 2002 races. In his red and white *Pitts Special* featured as part of the introduction to the article titled, "FLY LOW, GO FAST, TURN LEFT," Ferguson not only had RARA's guidance of "Fly Low, Go Fast, Turn Left" attached to his panel, but he added his personal reminder "Don't Do Anything Dumb." As we said in that issue, "Those words highlight the guidelines for the races while emphasizing the importance of doing it all safely." The same words are as meaningful today as they were then.

In an event where high speeds, close flying, and low altitudes are involved in each race, the margin for error becomes less and less the faster and lower you fly. That is why RARA, the flight crews, and the FAA work so closely together to make Race Week as safe as possible. The importance of the working relationship between the FAA's Reno Flight Standards District Office (FSDO) staff and RARA's staff and the pilots and crews at Reno cannot be stressed enough. As I noted in that article, "...I had the privilege of working with great group of professionals, both industry and FAA, at the 2002 National Championship Air Races in Reno, Nevada." That professionalism was apparent both on and off the racecourse.

I think the explanation for the close working relationship between those involved in the races and those with a federal safety oversight responsibility is multifaceted. I think the fact the races have been held for decades means that everyone involved knows and understands the risks that are a part of racing. Air racing is potentially dangerous, and everyone wants to minimize that risk. I also think, Reno is unique. Just like the other aviation cities that have their unique aviation culture, I think the air-racing culture at Reno is one of safety and knowing that it benefits everyone if that safety culture continues. Safety is part of Reno. Accidents have happened. But I think no one ever wants to see the races ended because of a failure to take adequate safety measures to protect the pilots and the public. I also think the City of Reno and those who live there understand the significance of what the races represent. As RARA's web site states, "The National Championship Air Races and Air Show is the only place in the world where you can see real air racing by multiple classes of aircraft up close and personal."

Need we say more?

If you have not made your plans to attend Race Week by now, it is not too late. But you need to make your plans quickly. In addition, if you go early, starting the weekend before Race Week, you can watch your favorite pilots and aircraft during time trials and testing starting on Monday, September 13. Check out RARA's web site for details. You can also check out Reno Nevada's homepage for information on the city and places to stay.

RENO-STEAD TEMPORARY FLIGHT RESTRICTED AREA

Located north of Reno near U.S. Route 395, Reno-Stead will have a temporary flight restriction in effect for the period from Sunday, September 12 through Sunday, September 19 during the hours of 0600-1600 PDT (1300-2300 UTC). During this period, the airport will be closed to all aircraft except race and show participants. A flight-restricted area will be in effect within five NM of the Reno-Stead Airport from the surface to 22,000 feet MSL (Flight Level 220).

RENO/TAHOE SPECIAL TRAFFIC MGT PROGRAM

There is an FAA Air Traffic Special Traffic Management Program (STMP) in effect for the Reno/Tahoe International Airport (RNO). All domestic, non-scheduled IFR arrivals and departures must have a slot reservation during the periods listed in the FAA NOTAM for the Reno area from September 16 through 20. Certain flight operations listed in the STMP are excluded from this requirement.

According to the STMP announcement, slot reservations will not be issued for more than 72 hours in advance of a planned arrival or departure time. You can request a reservation starting Monday, September 13, at 1000 PDT (1700 UTC). You can use the following web site, <www.fly.faa.gov/estmp/index.html>, or by telephoning (800)875-9755 to make a reservation 24 hours a day. You will need your destination/departure airport, estimated UTC time of arrival/departure, UTC date, call sign, and type of aircraft. You will receive a slot confirmation number, which must be listed in the remarks section of your flight plan. Flight plans should be filed at least four hours and not more than 22 hours before the proposed time of departure.

FLIGHT SERVICE ASSISTANCE AND FLIGHT PLANNING

If you plan on flying in the Reno area during this period, you need to review the Reno STMP and check the latest NOTAMS for any changes to the airspace or operating procedures. The Reno Automated Flight Service Station is located on the east side of the Reno/Tahoe International Airport. Pilot weather briefings, flight planning, and in-flight services are available 24 hours a day. You can call 1-800-WX-BRIEF (1-800-992-7433) or in Reno, Reno-Stead, or Carson City you can call 858-1300 for information.

GENERAL ADVICE

PILOTS

All pilots are cautioned to watch out for a lot of air traffic in and out of the Reno area during this period.

According to RARA's web site, general aviation pilots are advised to avoid Reno-Stead airport during Race Week or the weekend before Race Week, September 11 to 19, because of the limited ramp parking space and fuel availability on the airport.

In addition to the classic "see and avoid" reminder for operating in the Reno area, for pilot's planning on landing at Reno/Tahoe International Airport, the STMP says, "Pilots of single

engine aircraft should be prepared to park in designated grass or gravel parking areas. Tie-downs are not provided. Pilots are advised to bring tie-downs."

If you are planning on flying to Reno during Race Week, you should always check for the latest weather and airspace changes before every flight.

SPECTATORS

No discussion about an aviation event would be complete without reviewing a few air show safety reminders.

Since the event is outside in the high desert, everyone should bring plenty of water and sun block.

Bring along some lip balm to protect your lips from the heat and sun.

Comfortable clothing and good footwear for walking are desirable.

Hats and sunglasses are recommended.

Obviously, money is needed for food and gifts.

Although RARA works very hard to ensure your safety, everyone is reminded to comply with restricted or limited access areas, roped off areas, and smoking restrictions near the pits and aircraft.

In the event of an emergency, everyone needs to comply with any announced safety procedures.

Everyone should park in designated parking areas. Commercial transportation is available from Reno for those not wanting to drive to Reno-Stead. The RARA's web site has additional information for the shuttle buses with fees and pickup locations listed.

Although the aircraft crews enjoy your attention and photography, please comply with any of their safety comments.

In the case any aircraft are being towed in areas near public access, please remain clear of the aircraft and tow vehicles.

All spectators must remain behind the marked crowd control lines. The areas are designed to protect you in the event of an incident or emergency.

Please remember the classic rule of aviation events, "Always ask before touching."

Remember to bring more film, digital storage devices, or point in shoot cameras than you think you need. You will be glad you did.

Finally, the important thing is to have fun, so please enjoy Race Week. If you have access to the pit areas, please remain alert for any possible hazards around the aircraft. And if you are down in the pit area, stop by and say hello to the FAA staff members in the FAA trailer. You will be glad you did.

...querque Internatio...
...lloon Fiesta® 2004

...y and photos by Mario Toscano

Albuquerque, New Mexico has the welcome mat ready to roll out for the national and international ballooning community. The "ballooning capital of the world" is the center stage for the 33rd International Balloon Fiesta® from October 2-10. Fiesta organizers are anticipating the participation of more than 750 hot air and gas balloons. The 9th America's Challenge Gas Balloon Race—qualifier for U.S. participants in the prestigious Gordon Bennett's Race—is scheduled to launch at 5 p.m. on Saturday, October 2.

A volunteer board of directors made up of 24 members manages the Albuquerque International Balloon Fiesta. Rod May is this year's president.

Attendance to last year's Albuquerque International Balloon Fiesta®, widely accepted as the world's largest ballooning event, grew slightly over the previous years' attendance.

Last year's (2003) Fiesta registered 729 balloons. A total of 96 special shapes balloons flew in Fiesta 2003, and an estimated 841,902 people visited Albuquerque's Balloon Fiesta Park during the nine-day event. A total of 786 media representatives from 203 national and interna-

tional media organizations, including the *FAA Aviation News*, covered the event. Fifteen gas balloons participated in the event.

Balloons representing 40 U.S. states and 20 foreign countries also participated in last year's event. The first prize in the overall hot air balloon competition was awarded to Arkansas pilot Mike Wilson. The team of Richard Abruzzo and Carol Rymer Davis won the 8th America's Challenge Gas Race. The Annual New Mexico Challenge hot air balloon race had winners in three different categories: Belgian pilot Peter Van Overwalle and Montana pilot Dennis Waldron won Category One (less than 83,000 cu. Ft.), Colorado pilot Kerry Bogert and New Mexico pilot Daniel Williams won Category Two (83,000-90,000 cu. Ft.), and Texas pilots Ilene Visniewski and William Ludwick won Category Three (up to 105,000 cu. Ft.). Arkansas pilot Mike Wilson won the Key Grab Competition.

8th AMERICA'S CHALLENGE GAS RACE

U.S. pilots Richard Abruzzo and Carol Rymer-Davis landed in Iron River, Wisconsin after flying 1,110.89 miles and won the 8th America's Challenge Gas Balloon Race in 63.23 hours. The U.S. team of Barbara Fricke and Peter Cuneo arrived second, landing in Mora, Minnesota with 1,023.57 miles in 63.12 hours. The U.S./Germany team of Greg Winker and Wilhelm Elmers placed third after traveling 580.57 miles and landing in Bruceville Eddy, Texas. The U.S. team of Mark Sullivan and Cheri White finished fourth. Fifteen gas balloons participated in the event.

The America's Challenge Gas Race is a qualifier for U.S. representation in the world's most prestigious gas balloon race the Coupe Aeronautique Gordon Bennett. The three top U.S. teams in the America's Challenge race represented the United States this August 26 to September 4 at the 48th edition of the Coupe Gordon Bennett race in Thionville, France. The United States was represented in this year's Coupe by the teams of Richard Abruzzo and Carol Rymer-Davis, Barbara Fricke and Peter Cuneo, and Mark Sullivan and David Levin. More information about the Gordon Bennett race is available online at: <http://www.gordonbennett2004.org>.

The Education Committee of the Albuquerque Aerostat Ascension Association (Quad-A), as it customarily does before each Fiesta gas race, held a special "Fiesta Safety Seminar" for all participating teams. FAA's Albuquerque Flight Standards District Office, Air Traffic Control, and Automated Flight Service Station personnel presented pertinent information on charts, Air Traffic Control Centers, communications, weather, and flight services among the several topics related to the safety of the race.

This year's Fiesta Safety Quad-A seminar is scheduled for October 5. The organization's web site is a "must-visit" for balloonists. In addition to downloadable material such as prohibited zones (PZ), area maps, schedule of safety seminars, and the latest about Fiesta, <http://www.hotairballooning.org> provides valuable links to its visitors.

FAA's "TEMPORARY FLIGHT SERVICE STATION"

The FAA Albuquerque Automated Flight Service Station (AFSS) is scheduled to return for a fourth year to continue providing its online and live services directly to the pilots and crews participating in Fiesta 2004.

Last year, Operations Manager Thom Ochello, Jr., had his crew set up a "Temporary Flight Service Station" in the pilots' tent; and each Fiesta day they answered questions, provided maps, projected looping weather graphics on a wide screen, and held pilot briefs upon request.

Albuquerque AFSS personnel also staffed the America Challenge Gas Balloon Race Command Center to provide weather and aeronautical information to race contestants and offi-

At Press Time:

The United States wins the 48th Coupe Gordon Bennett

According to the preliminary results—as we went to press—coming from Thionville, France, the United States team of Richard Abruzzo and Carol Rymer-Davis is the winner of the 48th Coupe Gordon Bennett. Abruzzo and Rymer-Davis' balloon "Zero Gravity" landed August 31st northeast of Mullsjo, Sweden, after flying for a distance of 1,802 kilometers.

Germany's team of Wilhelm Eimers and Urlich Seel is reported second, after flying for 1,631 km also landing in Sweden. United States' Mark Sullivan and David Levin landed in third place after a 1,471 km flight.

This is the first time that the winning team includes a woman balloonist. Carol Rymer-Davis landed second in the Coupe Gordon Bennett twice before, in 1999 and 2000. If current preliminary results become final, the United States will host the 49th edition of the Coupe Gordon Bennett, next year.

Congratulations to all winners and participating teams for a memorable performance in the Coupe from the *FAA Aviation News* team.

cials as contenders flew across the United States.

The FAA Albuquerque AFSS direct support of Fiesta includes general information, automated services, frequencies, weather patterns, flight planning, and pilot briefings. Available maps include the New Mexico topography, weather reporting locations, airspace classification, area AFSS and Air Traffic Control frequencies, Airways-Jet routes, IR/VR routes, and restricted areas. Many of these products are also through the AFSS web site at <www.abqafss.jccbi.gov>, and for a weather briefing over the phone, you can call 1-800-992-7433(1-800-WX-BRIEF).

THE FSDO IN THE PILOTS AND CREW TENT

The Albuquerque Flight Standards District Office (FSDO) is also scheduled to have its customary remote facility in the pilots and crew tent at Balloon Fiesta Park.

The FAA has the responsibility to review the certificates and the currency of all participating pilots, as well as each entrant's balloon's airworthiness. Just like airplane pilots, balloon pilots must also meet federal requirements for certification. Balloons must be inspected for their airworthiness every year or every 100 hours of flight time, if flown for hire.

J.D. Huss, a senior aviation safety inspector with the Albuquerque FSDO, is the 2004 Fiesta's designated inspector in charge (IIC). In addition to managing the FAA booth from where he ensures that all FAA requirements are met, Huss deals with all last minute issues to ensure that Fiesta events are safe for participants and all spectators. To help Huss manage the large workload during Fiesta, the FAA selects and sends several inspectors from neighboring FSDO's to augment the FAA's temporary "office" at Fiesta Park.

FIESTA TIME NEW MEXICO'S MARVEL!

Albuquerque opens its doors and rolls out its best red carpet for Fiesta participants and all the visitors as it

ALBUQUERQUE INTERNATIONAL BALLOON FIESTA

Balloon Fiesta Park, Albuquerque, NM
October 2-10, 2004

Event Schedule

Saturday, October 2

5:45am	6:45am	Dawn Patrol Show
6:45am	7:00am	Opening Ceremonies
7:00am	8:30am	Mass Ascension
2:00pm	5:00pm	America's Challenge Gas Balloon Race inflation
5:00pm	6:15pm	America's Challenge Gas Balloon Race
5:00pm	7:00pm	Fiesta Challenge

Sunday, October 3

5:45am	6:45am	Dawn Patrol Show
7:00am	8:30am	Mass Ascension
5:45pm	8:00pm	Balloon Glow®
8:00pm	9:00pm	AfterGlow™ Fireworks

Monday, October 4

5:45am	6:45am	Dawn Patrol
6:45am	7:00am	New Mexico Challenge Hot Air Balloon Race
7:00am	8:00am	Flying Competition

Tuesday, October 5

5:45am	6:45am	Dawn Patrol
7:00am	11:45am	Flying Competition New Mexico Challenge Hot Air Balloon Race Sandia Casino Black Jack Race

Wednesday, October 6

5:45am	6:45am	Dawn Patrol Show
7:00am	10:00am	Flying competition and Mass Ascension Flight of the Nations

Thursday, October 7

5:45am	6:45am	Dawn Patrol
7:00am	8:00am	Special Shape Mass Ascension
8:00am	10:00am	Flying Events
5:45pm	8:00pm	Special Shape Glowdeo™
8:00pm	9:00pm	AfterGlow™ Fireworks Show

Friday, October 8

5:45am	6:45am	Dawn Patrol
7:00am	8:00am	Special Shape Mass Ascension
8:00am	10:00am	Flying Competition & Key Grab Competition
5:45pm	8:00pm	Special Shape Glowdeo™
8:00pm	9:00pm	AfterGlow™ Fireworks Show

Saturday, October 9

5:45am	6:45am	Dawn Patrol Show
7:00am	8:30am	Mass Ascension
5:45pm	8:00pm	Night Magic™ Glow
8:00pm	9:00pm	AfterGlow™ Fireworks Show

Sunday, October 10

5:45am	6:45am	Dawn Patrol Show
7:00am	8:30am	Farewell Mass Ascension

ALL TIMES AND EVENTS ARE WEATHER DEPENDENT
Please visit <http://www.balloonfiesta.com> for current schedule.

launches Fiesta on the first Saturday in October. With the first Dawn Patrol, scheduled for 5:45 am, balloon enthusiasts will savor nine days of exciting events with daily mass ascensions and balloon flying events. The 9th America's Challenge Gas Race lift off is scheduled for Saturday, October 2, at 5 pm.

From the inaugural mass ascension to the farewell mass ascension, the gas and hot air balloon races, evening glow spectacles, and special shapes ascensions, Albuquerque International Balloon Fiesta® is considered the largest and most photographed ballooning event in the world. In addition to the thousands of spectators who visit Fiesta Park each year, millions see the event on television segments worldwide.

Safety in ballooning and in Fiesta Park during operations cannot be over-emphasized. It is FAA's primary mission, as it is Fiesta event director Pat Brake. Brake instills in all her volunteers—more than 2,000 of them each year—that safety is their foremost concern. The Albuquerque FSDO is publicly grateful and complimentary for the "outstanding, all-around job" that Brake's team does in keeping Fiesta and Albuquerque's skies safe.

The FAA has succeeded in maintaining the highest safety record through the years at Fiesta because of this genuine collaboration from the event organizers and their leadership, dedication, and responsibility. All participants are to be commended for it!

If you are a participating pilot or crew in 2004 Fiesta, drop by the FAA booth in the pilots' tent for an AFSS briefing, to see the FSDO team and get a free copy of *FAA Aviation News*, or just to say hello. We look forward to seeing you there!

Thanks to the Albuquerque FSDO personnel and to J.D. Huss, Fiesta IIC, for support and help in facilitating our coverage of Fiesta 2003 and report on the upcoming Fiesta 2004.

ALBUQUERQUE INTERNATIONAL BALLOON FIESTA

October 4 -12, 2003

FINAL NUMBERS

- Registered balloons: 729
- Total special shape balloons: 96
- Total gas balloons: 15 .
- Estimated spectators: 841,902
- Media organizations: 203
- Media representatives: 786
- States represented: 40
- Countries represented: 20

BALLOON COMPETITION WINNERS

- The 8th America's Challenge Gas Balloon Race was won by the USA team of Richard Abruzzo and Carol Rymer Davis.
- Mike Wilson from Arkansas was the overall hot air balloon competition winner.
- Mike Wilson also won the Key Grab competition.
- New Mexico Challenge Hot Air Balloon Race results:
  - — Belgian pilot Peter Van Overwalle and Montana pilot Dennis Waldron won the 83,000 cu.ft. and under (Category One);
  - — Colorado pilot Kerry Bogert and New Mexico pilot Daniel Williams won the 83,000 to 90,000 cu.ft. (Category Two).
  - — Texas pilots Ilene Visniewski and William Ludwick won the up to 105,000 cu.ft. (Category Three).

Balloon Federation of America

to Study Minimum Safe Altitudes

by Ruth Lind

When it comes to an in-flight emergency, lower altitudes enable a balloon pilot to land quickly and safely and with the greatest possible control of the aircraft, thus minimizing risk to those on the ground and in the air. Flexible altitude restrictions provide safer operations with respect to flying balloons. For that reason, and that reason alone, the Balloon Federation of America (BFA) petitioned the FAA to sanction a study to gather data with an eye toward clearing the way for a rule change to Title 14 Code of Federal Regulations (14 CFR) §91.119 (b) and (c) for lighter-than-air flight. The one-year study began March 1, 2004, when the exemption was approved.

Flight characteristics for balloons differ significantly from those of airplanes in that balloons have no means of propulsion through the air, only the ability to change altitude. That means for the balloon to change horizontal direction it must change altitude to take advantage of different air currents. At no time is this maneuverability more critical than during the landing phase of the flight. In order to maneuver the aircraft into a suitable landing site, the pilot must use wind speeds and direction at lower altitudes with skill and finesse, particularly in other than flat areas of the country, while of course exercising utmost caution to provide for the safety of persons and property on the ground.

The Grant of Exemption permits a limited number of BFA pilots to fly at 500 feet AGL over congested areas and 200 feet AGL over non-congested areas. In addition, the pilots may, over congested areas, demonstrate approaches to suitable landing areas with a break-off altitude of 200 feet AGL with no intent to land.

Far from being a free pass for low flying, the study requires participating pilots to meet a number of standards. First of all, each pilot must hold a commercial rating for balloons or enough hours to qualify for a commercial rating, and the pilot must be current, including flying within 30 days of flight testing. No paying passengers may be carried on study flights nor may instruction be given. During the flight, an observer must collect and record wind speed and direction data on a form approved by the BFA and the FAA. In addition, local FAA aviation safety inspectors will be invited to fly and observe each test flight. After the flight, the pilot will immediately file the completed test profile forms with the BFA Office, which will forward them to General Aviation and Commercial Division's AFS-820, monthly.

It is interesting to note that a significant number of balloon events operate throughout the country each year under waivers providing relief from the requirements of 14 CFR § 91.119(b) and (c). Many of these waivers call for flight operations identical, or nearly so, to the restrictions in the Grant of Exemption. At no time has any deterioration of safety been observed or recorded under these waivers. For the purpose of gathering data, however, the BFA and FAA wish to consider flights under normal operating conditions outside the realm of structured events.

While the study guidelines lower the minimum safe altitude requirements, they do not change the important provision of 14 CFR § 91.119(a), created to prohibit pilots from causing a "...hazard to persons or property on the surface." In other words, even while participating in the study, BFA pilots will not consider this a license to fly low in areas where such operations would be inappropriate, such as over certain livestock. The BFA heartily endorses this paragraph of 14 CFR § 91.119 for all pilots.

A critical component to the BFA study is the BFA Flight Profile Form, submitted after each flight made under the provisions of the exemption. On this form, pilots will record the details of the preflight weather briefing and the measured conditions actually present during the flight. An observer, using a GPS, will record wind speed and direction at 100-foot altitude increments below 1,000 feet. The pilot will note changes in actual conditions from those forecast, as well as changes occurring during flight. The pilot will also record the speeds and directions necessary for a suitable approach and landing, and at what altitudes these were found.

Let's take a look at how this form will contribute to a better understanding of balloon operational conditions.

Carol has planned a morning flight for Saturday and has briefed her crew and prepared her equipment on Friday evening. Since the winds are most stable within two or three hours of sunrise and sunset, and sunrise the following day will be at 5:30 a.m., she's in bed early. Carol sets her alarm for 4:15 to call the Flight Service Station (FSS) in preparation for a launch at 5:45.

The briefer tells Carol that surface winds at the airport nearest her launch field (remember, balloons rarely use airports for launching and landing) are currently out of the southwest at less than five knots. The forecast calls for winds 200° at six knots through 8:00 a.m., and 210° at 10 knots through 11:00. The reporting airport is about 30 miles away, so Carol will want to send up a helium pilot balloon (pibal) before she takes off. Winds aloft at the nearest reporting station, over 100

miles to the west, are 220° at 12 knots at 3,000 feet, 240° at 17 knots at 6,000 feet, and 250° at 25 knots at 9,000 feet. The ceiling and visibility are unlimited, temperature and dew point more than 10° apart (fog won't be a problem) and nothing shows up on radar within 200 miles.

Carol expects a beautiful flight. She knows the reporting airport sits atop a large, flat hill, so the five knots reported there is probably the strongest surface wind she'll encounter. She plans to be on the ground before 7:30 a.m., so the wind speed for her flight should be well within her safety window, even hours after her planned landing.

As she climbs, the winds will veer or shift to the right with altitude. Veering winds indicate stable weather. The opposite will also be true. As Carol descends, especially when she's on landing approach, the direction will shift to the left. As the sun heats the night-cooled boundary layer near the earth, the atmosphere and winds begin to mix. Later in the morning, the direction and speed of the reported or actual winds aloft will eventually reach the surface. Therefore, as the morning progresses, Carol will lose her left turn during descent. It may happen before her landing, or not until hours later, depending on her local conditions.

Arriving at the launch site, Carol releases a pibal. As it climbs, she watches its speed and direction and notes that the winds at the surface are from 180° rather than the reported 200°. They're also much slower, more like two or three knots. The pilot knows this is partly due to the terrain. Remember the airport reporting station is up on a hill, and Carol's launch site is a large grassy field in a river valley. The river flows from north to south down a valley about 800 feet below the tops of the ridges on either side.

After launch, Carol floats at 300 feet AGL up the valley for about 20 minutes. Her general direction is to the north, at an average three knots. Then she climbs out over the ridge, and turns toward the east with altitude. She finds that at 2,000 feet, she's heading pretty well east, at 15 knots.

Mario Toscano photo

Her pre-flight FSS briefing would have had her flying 50 degrees more toward the north at a somewhat slower speed. Oh well, the winds aloft reporting station is more than 100 miles away, after all. And she has seen this shift in her pibal.

The difference in direction, however, means that there is no way Carol will be able to land in her uncle's fallow pasture, as the forecast and first flight plan would have indicated. She'll be well south of that by the time she reaches it. She selects an alternate landing site, based on the flow of the stream in the next valley (wind speed and directions change over water), the changing wind direction as the sun rises higher in the sky, and the direction of the smaller ridgeline she will cross.

About two miles away from her landing site, the pilot descends slowly to 700 feet, making a gradual shift in direction toward the north as she does so. From careful observation and past experience, Carol knows there are some crops, but no livestock between her present location and her landing spot, a freshly mown field.

At a half mile out, she comes down to 300 feet, again shifting her direction by 5°. Now on her final approach, she notices the morning mist from a farmer's pond is drifting due north, so she waits until she's nearly due south of her chosen field to drop to the surface and glide in for a stand-up landing next to the road.

Carol's observer, meanwhile, has recorded every change of altitude and direction throughout the flight. After they've packed up the balloon and thanked the landowner for his hospitality, the pilot and observer complete the BFA Flight Profile Form. On paper, the collected numbers, as compared to the FSS briefing numbers recorded before launch, show differences in speed and direction that have made a

six-mile difference in Carol's landing site. The pilot, of course, expected this before take-off to some degree, but the ability to use the valley flows and indicators in the form of morning mist have enabled her to maneuver her aircraft with skill and finesse. A precise, gentle landing has resulted. Had she been required to use only the winds above 1,000 feet, her landing might well have been harder and much less precise.

Carol's form, with hundreds of others, will show these minute changes and their effects on flying balloons safely, in virtually all parts of the country. While Carol works with valley drift in the Appalachians, Tom accommodates a low-level jet in Iowa. Diane navigates the mountain currents in Colorado, while Ray plays the canyon drainage winds in Albuquerque. Joe plans a magnificent sea-breeze flight on a spring afternoon in Maine. In all these areas, terrain and local weather trends provide the only horizontal control a balloon pilot can use, the direction of the breeze. Just a few degrees of directional shift, or a knot or two of speed, makes a significant difference in the direction of the flight. And these changes are found at altitudes within a few hundred feet of the surface. The ability to use these lower altitude currents gives the balloon pilot a most valuable tool in the operation of his aircraft.

If you are skilled with a GPS, you might contact a local BFA pilot participating in this study to request an observer spot. You'll learn a lot as you record the minute changes in speed and direction and see firsthand what those changes mean for the pilot in terms of control. And for the first time, data collected in this study will provide a scientific look at how balloons really fly. With this data, the BFA study hopes to show that lower operating limits for balloons can enhance safety for persons or property on the ground and those in the basket.

Ruth Lind is the Director of the Balloon Federation of America's Northeast Region

Rules to Live By...

A Brief Overview of

The term "glacial" is often used to describe the pace of regulatory change within the Federal Aviation Administration (FAA). Because rulemaking projects often take years instead of months to complete, there is a mistaken belief that stagnation is the inevitable result of government inefficiency. While there are always opportunities for improvement within any organization (including the FAA), the fact is that rulemaking, by design, is a slow and deliberate process. It must be so, because the FAA has the formidable task of protecting the flying public, while balancing the needs of industry. As a result, the consequences of reckless policy or regulatory changes are simply too great. For this reason, any progress must come at a purposeful and methodical pace.

Regulatory Philosophy

In addition to being unhurried, the FAA is often accused of having a "tombstone" mentality. That is, a rising body count is needed before the FAA is compelled to take action. This over-simplification is often used by those outside the government to highlight a perceived issue or deficiency. However, if the FAA proposed a costly regulatory change absent the proper justification, industry would be quick to voice their objections both to the FAA and their elected officials.

This is often the point at which people cry out, "How can you put a cost on human lives?" In a world of infinite resources, this would be an unthinkable concept. However, because every dollar spent on one safety initiative takes a dollar away from another, the FAA must take great care in choosing which actions will produce the greatest possible safety benefit. As you might imagine, this often leads to debate among government, industry, and the flying public. Moreover, this is one of many contentious issues a rulemaking effort is likely to face prior to becoming a regulation.

The Regulatory Process

With all its many intricacies, even the most grizzled industry insiders are often mystified by the FAA's rulemaking procedures. Although complex, the regulatory process does flow in a reasonably logical manner. What follows is a brief, high-level overview of how regulations come to exist.

Like any major initiative or undertaking, a rulemaking project begins as the result of an identified need. The factors influencing a regulatory change include:

- Petitions for rulemaking and exemptions,
- Congressional mandate,
- Recommendations resulting from accident investigations,
- Technological change or innovation,
- Changes in operational practices,
- Internal FAA safety analysis, and
- International harmonization.

Once a need is identified, the office of primary responsibility (OPR), that is, the office charged with oversight of the regulation, will begin drafting a Phase I rulemaking project record (RPR). The purpose of the Phase I RPR is to define the scope of the project. It is also the vehicle through which a project gains approval, allowing it to move forward within the FAA.

When complete, the core Rulemaking Council members will review the Phase I RPR to determine if it is ready for full Council review. These core members consist of the Director of the Office of Rulemaking (ARM) who

by Michael W. Brown

the FAA's Regulatory Process

serves as the Council chair, and representatives from the Office of the Chief Council's Regulatory Division (AGC) and the Office of Aviation Policy and Plans (APO) respectively. If the core Council determines the project is ready, it will move to the full Council for review. If it is not, the OPR may be asked to complete a Phase II RPR in which they supply any additional information that is needed. Once the project moves to the full Council, it will be reviewed by all program offices engaged in the rulemaking effort.

From this point, the Council may decide to move in any number of directions. The project may be approved, deferred pending additional information, cancelled, or assigned to an appropriate rulemaking committee for action. The process involved in the latter would fill an entire book, so let's assume the project has been approved.

An approved project will be assigned a team, which usually consists of representatives from the OPR, AGC, APO, and ARM. Each member serves a specific function on the team. The OPR representative assumes the role of project lead and is the technical specialist for the project. The lawyers from AGC determine if the project lies within the scope of the FAA's legal authority and if the action proposed is otherwise legal or unduly exposes the FAA to liability. Representatives from APO serve as the economists, determining if a rule will place an undue economic burden on the public. Simply put, they assess potential benefits to ensure they outweigh potential costs. Finally, there is the rulemaking analyst from ARM. In addition to coordinating the movement of the project through the FAA, the ARM analyst also prepares *Federal Register* notices, coordinates/facilitates public meetings, and serves as the technical writer by drafting the actual rule language. This is no small task when you consider the precision with which regulatory language must be written.

So with a team now in place, work will begin on identifying issues and developing a project schedule. The goal at this point is to develop a Notice of Proposed Rulemaking (NPRM), which will be the team's best recommendation for how the regulation should look. This process is often long and laborious, as team members work to identify and address all potential issues. In an effort to do this, it may be necessary to hold public "scoping" meetings to solicit input. These meetings become a matter of record, and any issues or insights raised will be considered as the project moves forward. In cases where the team needs more guidance, they may elect to move forward with the issuance of an advanced NPRM (ANPRM). This is how the FAA informs the public it is considering a particular action, while requesting much needed feedback. Unlike an NPRM, the ANPRM is much less developed, focusing more on data collection than actual rule language.

Once the individual team members and their management concur with the NPRM, it is nearly ready to be issued for public comment—in some cases. Depending on the nature of the project, it may be controversial enough or costly enough to warrant what's called a principals briefing. The team will normally give such a briefing to the director(s) and associate administrator(s) from each line of business impacted by the project. Such an NPRM may also require approvals from the Office of the Secretary of Transportation (OST) and Office of Management and Budget (OMB) prior to moving forward. It is not unusual for additional issues to be raised at this point, which requires further work by the rulemaking team. Assuming all such issues are resolved, the NPRM will be issued and published in the *Federal Register* for public comment.

The comment period is typically 30 days or more, and may extend to 120 days for rules of greater complexity. The public may also petition for a longer comment period as needed. Once the comment period closes, the rulemaking team will begin reviewing and addressing all public comments. Based on this feedback, the FAA may decide to move forward with the issuance of a final rule, issue a final rule with a request for comments, issue a supplemental NPRM based on changes to the original document, or withdrawal the notice all together. If significant issues are raised, and the program office still wishes to move forward, it may be necessary to draft an entirely new NPRM to address public comments. However, if no substantive comments are received, or the comments can be addressed, the FAA is then in a position to issue a final rule. The coordination of a final rule is similar to that of an NPRM, and it follows much the same process on its journey through the FAA.

The Issue of Significance

Once a final rule or NPRM is ready to leave the FAA, it may still not yet be ready for public comment. In these cases, the project will find its way to OST/OMB for additional review and approval. Such reviews occur when a rule is deemed to be significant, meaning:

- The proposed rule would have an annual effect on the economy of $100 million or greater; or
- The proposed rule would adversely affect the economy, a

sector of the economy, productivity, competition, jobs, the environment, public health and safety, or state, local, or tribal governments or communities.

In other words, if the proposed regulation is costly or concerns a matter on which there is substantial public interest or controversy, it is likely to undergo OST/OMB review.

Why So Slow??

The aforementioned process, while cumbersome, assures that the FAA has performed the necessary due diligence. But why then does it take so long? First and foremost, the process is long because the FAA solicits public comments. While rules could be quickly promulgated without this input, it would do a tremendous disservice to the public to ignore valuable comments. Public comments also allow the FAA to hear and learn from the experts within the aviation industry.

Some other potential roadblocks or constrains include:

- Competing priorities within the FAA/lack of internal resources;
- Outside political influences/industry objections;
- Cumulative effects of multiple rules creates a severe financial impact;
- Lack of justification based on comments, changing environment, etc.;
- Lack of organizational commitment (with changing administrations comes changing priorities).

The review process is designed to involve every possible stakeholder. This review all but guarantees that most rulemaking efforts will be lengthy. Hopefully, it also ensures a final product that best serves the needs of the flying public.

Public Participation

Thanks to the Internet, it is now easier than ever to follow the FAA's regulatory efforts and participate in that process. To view FAA documents open for comment, visit <http://www.faa.gov/avr/arm/proc.cfm?nav=part>. Each document open for comment has a docket number that serves as a hypertext link to the Department of Transportation's Docket Management System. There you can read the NPRM or final rule and submit your comments on-line. You may also review comments submitted by others.

Let's assume you wish to go beyond commenting to an existing proposal and instead propose a rule of your own. The Office of Rulemaking provides helpful on-line guidance, which may be found at <http://www.faa.gov/avr/arm/petitions.cfm?nav=part>. Keep in mind when submitting a petition for rulemaking that your proposal must compete with over 70 other major initiatives in order to move forward.

By visiting the same link, you may also learn how to petition the FAA for an exemption to an existing regulation. While Title 14 of the Code of Federal Regulations (14 CFR) part 11 outlines the specifics of a petition's requirements, keep in mind two major considerations. First, you must ensure an equivalent level of safety when operating outside of a regulation. Second, the granting of a petition must also be in the public's best interest. If you cannot speak to both points in your petition, your chances of success are nil. One final point—the fact that you disagree with a regulation is not sound justification for granting an exemption. Avoiding emotionally based arguments while focusing only on safety and public interest will maximize your chances of success.

In Closing

Given the complexity of most FAA rulemaking projects, it's easy to see why new regulations often take years to reach the public. Although it is often frustrating to parties on all sides of a given issue, responsible administration carries with it the need to ensure the public suffers no unintended consequences resulting from a regulation. Also, keep in mind that when people say that a given rule change should be quick and easy, this usually stems from the mistaken belief that everyone else shares his or her vision or idea. In aviation, this is typically not the case. In short, if you think there's a simple answer, you may not completely understand the problem. Moreover, if you don't believe that people are reluctant to change, just try getting a new regulation on the books.

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Calendar of Events

September 16-19, 2004. 41st National Championship Air Race and Air Show, Reno, NV
To be held at Reno-Stead Airport.
For more information, see page 9.

September 25-26, 2004. Daniel Webster College's Aviation Heritage Festival, Nashua, NH
To be held at Nashua Municipal Airport with warbirds and vintage aircraft will be on display. For more information, visit <www.dwc.edu/festival> or call (603) 577-6622.

October 2-10, 2004. Albuquerque International Balloon Fiesta ® 2004, Albuquerque, NM
To be held at Balloon Fiesta Park.
For more information, see page 12.

October 15-16, 2004. Pompano Beach Air Fair 2004, Pompano Beach, FL
To be held at Pompano Air Park with air performances and displays. For more information visit <www.airfair.org> or call (954) 782-7287.

Dan Wayland photo

Drop Zone Flying for the GA Pilot

by Jennifer Jager

Whether you are the pilot who has already operated at a skydiving drop zone airport or the one who will, it is good to know there is a method to the seeming madness of "parachutes everywhere" and that "jumpers away!" doesn't necessarily mean "RUN AWAY!" Understanding skydiving operations and the jump pilot's flying environment may help alleviate any apprehension or confusion experienced when flying at or around airports with a drop zone (DZ). As a jump pilot, I have witnessed pilots in the pattern hear the "jumpers away" call, decide they have to get out of there and often head into a worse place to be. Hopefully, a better understanding of what to expect from jumpers and their pilots will promote safety and foster a good working relationship between airport users.

Flying skydivers is an exciting specialty in commercial aviation and a great way to build time. Since it is commercial, jump aircraft are required to have 100-hour inspections. However, we operate under Title 14 Code of Federal Regulations (14 CFR) parts 91 and 105, not 119 or 135, since the jumpers are not considered "passengers." The most common modifications to the aircraft involve a jump door and interior reconfiguration. For example, a Cessna 182 would have a right-side door hinged at the top, the seats (except pilot seat) and right-side control yoke removed, and seat belts installed for four skydivers. Any modifications require the appropriate maintenance, Supplemental Type Certificates (STC), Forms 337, etc. The owner/operator also must have FAA-approved Operating Limitations, which state restrictions such as on pitch and bank angles and parachutes required.

Like towing gliders, hauling sky-

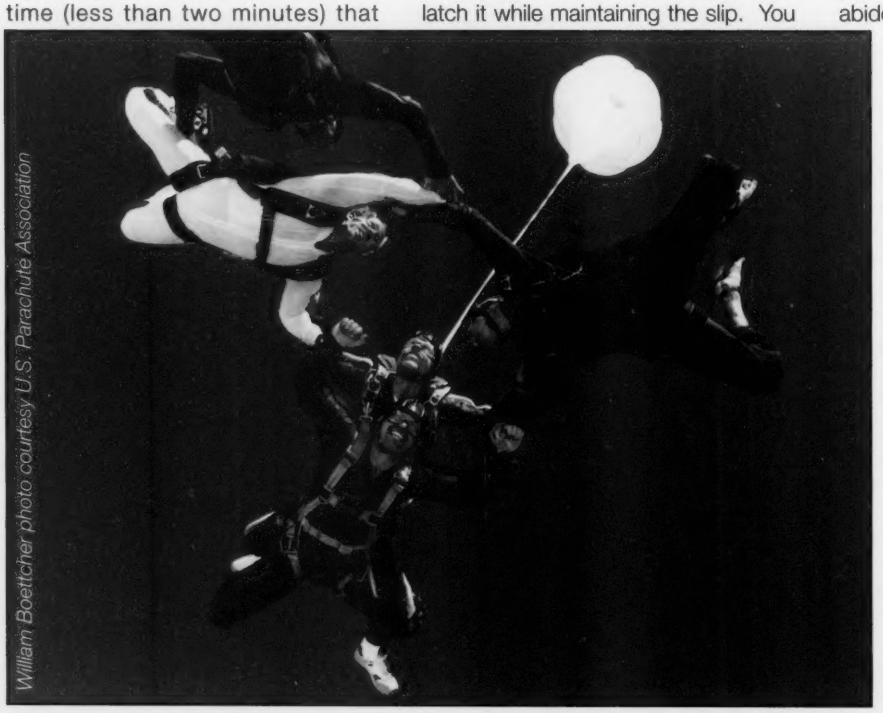
divers has its unique characteristics. And, like the glider pilots preferring their tow pilots to have some soaring experience, skydivers prefer a jump pilot who has an understanding of their sport. As odd as it may seem, many skydivers do *not* enjoy the plane ride to altitude, so a professional attitude and smoothness with commercial flying skills is greatly appreciated.

The Cessna 182 has historically been the most common skydiving vehicle, but that is changing. The 182 will be the aircraft used at smaller drop zones (DZ), and it is most likely where a new jump pilot would get experience before moving into the increasingly popular turboprops. As mentioned above, you have the only seat as four jumpers climb in and bend themselves to sit on the floor around you, sometimes bumping your mixture, throttle, flaps, or even twisting your fuel shut off.

Ninety per cent of your time is spent in two attitudes: up and down, which for reciprocating engines translates to hot and cooling, so you get a great education in engine care such as preventing shock cooling, proper leaning, and power settings. The minimal time (less than two minutes) that you're straight and level is called jump run. On any given day, there is a small area over the ground (the "spot") that is ideal for a jumper's exit to allow them to land where desired. It takes experience to be efficient and to get to the right spot, at the right altitude, at the right time. It can vary from directly overhead to several miles upwind of the drop zone based on the jumps planned and on the winds at all altitudes below. Jumper exit may be anywhere from 2,500 to 15,000 feet AGL, and they can be in groups of one to more than 20.

Intentionally opening the door in flight is a unique characteristic. And I don't mean cracking it—I mean opening the side of the aircraft for several people to leave, often all at once. Jump plane doors vary, but no matter, there is usually a considerable change in the cockpit environment. Opening a C-182 door in-flight for the first time is attention getting with the wind, noise, and view change. After everyone leaves, it is still aerodynamically "attached" to the bottom of the wing. It takes an aggressive, initially uncomfortable slip to break the door free. Then you lean across the cockpit and latch it while maintaining the slip. You appreciate TSO'd (Technical Standard Orders) seat belts the first time a rear seat safety belt sneaks out and bangs on the fuselage as you have to literally lie down across the cockpit to pull it back in before closing the door. The larger jump aircraft often have Lexan roll-up doors (or tailgates). If the last jumper doesn't close it on the way out and it can get cold (like -20°C) at altitude!

Many takeoffs occur at maximum gross weight and many landings take place at minimum (often needing full nose up trim and full elevator to get a good flare in a 182). Meanwhile your cargo moves around constantly during the climb then they often put as many as possible outside one side of the aircraft until they all leave at once. Full control movements are not uncommon. And "topping it off" is essentially unheard of as fuel is carefully calculated to maximize jumper load while adhering to regulations. Skydivers often get twitchy when winds gust greater than 20 mph, so you may get a break from huge crosswinds. However, clouds don't necessarily stop them and can be challenging for the pilot as all the jumpers must also abide by 14 CFR § 91.155 for clearance requirements and VFR weather minimums while they are in freefall or under canopy.



William Boettcher photo courtesy U.S. Parachute Association

Turboprops are often used at the larger DZs. Because of turbine power and characteristics, the climb and descent rates are huge (pegged needle or greater than 3,000 fpm) and can be unnerving at first. The plane is often landing at the same time as the jumpers who have just fallen about 10,000 feet at 120 mph before opening their parachutes. Turnarounds between jumper loads can be 40 minutes for Cessnas and under 20 minutes for turboprops during which you climb and descend through double-digit thousands of feet and maintain communication with air traffic control (ATC) and UNICOM and sometimes a DZ manifestor. It can be busy. ATC tries to help with any threats of aircraft below

Steve Scott photo courtesy U.S. Parachute Association

and the pilot and skydivers scan the airspace before exit.

There are unique emergency situations, too. One deadly scenario is a skydiver hitting or the gear opening early and wrapping around parts of the exterior airplane. An open parachute can rip the tail off. Some accidents have occurred due to a stall when the pilot fails to correct for the sudden increase in drag when they climb out or for the center of gravity (CG) shift when they all move to the rear.

There are about 200 United States Parachute Association (USPA) member drop zones in the U.S. These operations have agreed to abide by USPA's Basic Safety Requirements. Most skydiving operations are grateful for the use of public airports. We certainly want to maintain good relations with the other pilots and never want to scare people away. The following tips are provided to help share the airspace.

When flight planning or flying by pilotage, take notice of the little magenta parachute symbols. They usually mean it, especially on Saturdays and Sundays. Many jumpers abide by the rule "Jump only when the temperature is above your age," but there are a lot of 20-something skydivers, so ridiculously cold weather is not enough to stop ops.

If your flight plan includes landing at or transitioning within five miles of one of these drop zones, monitor ATC for that area listening for the "one minute to jumpers away" call or for their traffic advisories (possibly you) or ask UNICOM if the jump plane is up. A typical load will exit at 14,000 feet in numerous groups, fall about one minute, and be under canopy for about two minutes. However, some prefer opening very high for a very long canopy descent.

Even if jumpers are exiting, in free fall or under canopy, it is still safe to approach and land or to take off. Use pattern altitude, a wider pattern, and enter on the 45. **Please do not cross midfield.** By the time they get to your pattern altitude, all jumpers should be under canopy and within range for their non-powered glide to the landing area. This will put them inside your pattern (unless the spot was off, which does happen). Don't forget to look and listen for the plane they just got out of, since it can often land at the same time with its high rate of descent. Listen carefully for the jump plane's radio calls, but don't rely on the jump pilot hearing all your calls on UNICOM. When he's up at 13,500 feet, he's hearing all traffic and squeals on that frequency in over a hundred mile radius and often must turn the volume down on UNICOM to focus on ATC.

The absolute worst place to find oneself is from pattern altitude up to 14,000 feet over or upwind (winds aloft) of the airport and DZ. People are falling through that air at over 120 mph and canopies can be opening at *any* altitude. In one accident years ago, a transiting plane was the loser in a battle with a freefalling skydiver.

Hauling jumpers can be an enjoyable use of a commercial license. Your cargo loads and unloads itself. It is time-building in high-performance aircraft at the least, and there is potential for night flight time, too. (Yes, they sometimes jump when it is pitch black). You maintain your skills to a commercial level, and you learn a whole new side of the federal regulations and about Form 337s. Please visit a DZ. Just don't park in the nice grass field out front; it's probably where the skydivers land at 25-50 mph. Or better yet, come experience a jump—you know there is no such thing as a perfectly good airplane.

Jennifer Jager (Comm/CFI-ASEL, AMEL, Instr) is a jump pilot at Skydive Orange <www.skydiveorange.com> and Skydive Virginia! <www.skydivevirginia.com>.

Designed To Crash

by H. Dean Chamberlain

Recently, I was discussing the crashworthiness of aircraft when a book I remembered reading came to mind. The book discussed how aircraft design could help you survive an accident or contribute to your death or injury. For example, the book told how an experimental aircraft with a wing carry through spar directly under the pilot's seat contributed to the pilot's injuries during a crash when the vertical forces from the crash were transmitted through the spar and seat to the pilot's spine. The seat was attached directly to the spar. A better idea would have been to insert some type of load absorbing material or a seat designed to absorb energy between the spar and the pilot such as a high "G" seat designed for military helicopters to help absorb vertical forces.

The book also included graphic photographs of injuries resulting from failed aircraft structures and objects located in the cabin. One of the most important lessons of the book was the value of seat belts and the critical role shoulder harnesses play in crash survival. One autopsy photograph showed what happens when a control wheel stops the forward motion of a pilot. The wheel broke, and its shaft impaled the pilot through his chest. The pilot was killed. A shoulder harness might have saved his life. Although we will never know for sure in this case, it is important to reduce the chance of a person hitting or striking anything in the cockpit that can kill the person in an accident. Where survival is critical and appearance and style secondary, full five-point shoulder harness and seat belts would enhance safety. Since not everyone wants to wear such restraining harness, the across-your-shoulder harness is better than no shoulder harness at all. For aircraft built before the requirement that new aircraft have shoulder harnesses in the front seats, pilots are encouraged to install them. FAA permits owners to install shoulder harnesses in their aircraft with a minimum of paperwork.

The intent of this article is not to review gory photos or fatal accidents for the sake of seeing crash photographs, but to point out to everyone that they should review the safety features and potential hazards of the aircraft they fly or ride in to help determine the best way to crash: hence the title "Designed to Crash."

I think the best contemporary example of this idea was the adaptation of head restraints in stock car racing after the death of Dale Earnhardt at the 2001 Daytona 500 race. For those not familiar with his accident, he hit the wall at high speed on the last lap of the race. He died from massive head injuries. The new head restraints, better known as HANS (head and neck safety), in many of the racecars are designed to use equipment and technology to help drivers survive a crash. Since many racecars now run faster than many light aircraft fly, I think we can learn valuable lessons from the design of such vehicles.

Every pilot from the first day of flight training has heard the caution to always fly the aircraft regardless of what happens in the air. Many pilots remember this advice as aviate—navigate—communicate. The reason for the advice is that an aircraft under control provides options for its pilot. An aircraft out of control is a collection of parts looking for a place to land.

I submit that not only should a pilot keep control of the aircraft during any type of emergency, but that the pilot should consider the safety design or lack of such design in the aircraft to determine how to crash.

An accident I heard about highlights this idea. A two-place training glider crashed into treetops. The two onboard survived the accident with only bumps and bruises. They escaped serious injuries while the aircraft was destroyed. Were they lucky or did they crash by design? I don't know. But I would like to think they crashed by design.

High performance gliders are normally made of composite material and in most cases, the pilot flies semi-reclined in a hi-tech composite cockpit with the pilot's legs and feet stretched out with the pilot's legs wrapped around the instrument panel. In such a configuration, the pilot's legs and feet are vulnerable in a crash. In that same cockpit design, the pilot is reclining on a hard seat pan. In many cases, the best padding is the pilot's parachute, if one is worn. In case of a crash with strong vertical forces, the pilot runs the risk of spine damage. If you hit something head on—you risk your legs. (See photo above)

The question is what do you do?

The first recommendation is to review your aircraft's manuals for any suggestions and procedures unique to that aircraft.

The next recommendation is to review your aircraft's operating numbers. Since you always want to aviate all the way to your crash site, you need to know how slow you can go before the aircraft stops flying. How proficient are you at slow flight? How capable are you at making slight turns at minimal control airspeed? Can you fly all the way to the crash scene in control? You never want to stall and possibly spin near the ground. You will probably impact the ground before you can recover. How slow can *you* land? Remember the slower you land, the less energy you have to dissipate. The less energy your body has to absorb at touchdown, the greater your chance of survival.

The third recommendation is to do a safety check of your aircraft. Are all loose objects properly secured? Will they remain secured in case of a crash? Unlike many new cars that are designed to absorb crash forces by designed crumpling areas built into the vehicles to help protect the occupants; aircraft normally are not designed with such features. The only exceptions are certain helicopters and agriculture-type aircraft. Better known as Ag planes, agriculture aircraft, I think lead the way in pilot safety since they operate in a high-risk environment low to the ground. Like their racecar counterparts, Ag pilots normally wear helmets and operate in roll cage protected cockpits designed to protect them in the event of an accident. Am I saying every Ag plane is so equipped, no, but the safety trend is there.

But not everyone wants to wear a helmet or fly an Ag plane for his or her next $100 hamburger. Then the next best option is to check your aircraft for ways to improve your safety in case of an accident. For example, I knew of an owner of a light twin aircraft who strapped in the back of his aircraft dumbbell weights to shift the center of gravity aft to keep rental pilots from slamming the nose wheel onto the ground when landing. Although he used straps to secure the weights, would you like to be in a crash with about 100 pounds of dead weight flying through the cabin? The same can be said of baggage. Do you fly with your baggage properly secure? Since many pilots carry extra oil in the back of their aircraft, will your oil containers stay secure when you have that sudden stop?

Now some people have brought up the idea of airbags in aircraft. Other than the risk of them going off in flight, inflating, and then blocking both vision and control access, they might provide an important safety feature in case of a crash, if their inflation could be controlled. This idea has merit.

Since an aircraft design is a series of compromises, and since many of the aircraft we fly today are based upon designs of the 1940's, 1950's, and 1960's, it will be interesting to see the GA aircraft of the future as various universities, industry, NASA, and FAA teams work on the aircraft transportation system of the future.

One such project is the NASA Small Aircraft Transportation System (SATS) program. According to a NASA SATS brochure, "NASA is developing technologies that would create a futuristic 'interstate skyway' system to complement today's transportation modes." All weather landing capability, automated air traffic control, and traffic and weather on demand are some of the areas being worked on. According to the brochure, other areas include, "Manufacturing methods to make planes more affordable and reliable. NASA is striving to simplify aircraft construction, while revolutionizing safety, energy efficiency, and environmental impact."

As these research projects continue and products are developed, it will be up to all of us to operate the new aircraft in a careful and thoughtful manner. Dr. David Hunter (a psychologist now retired from the Office of Aviation Medicine, FAA Headquarters) once explained the problem as when new safety features are developed, they don't necessarily equate into increased safety. It seems people being people, they use the new safety features to push the safety envelope to a higher limit and continue to expose themselves to greater risk. Instead of taking advantage of the increased safety the new technology provides, such as disk brakes on cars, the trend is for people to put themselves at greater risk by depending upon the new technology to save them from themselves as they take greater risks. So we will all have to wait to see what new safety features the future will bring to aviation. But in the mean time, take a moment to check your aircraft and operating habits for any hazards that can be eliminated or can be reduced to an acceptable level. You can't afford to wait for the next generation of aircraft to save your life today.

The U.S. Air Force has a very good program of risk management. It has been teaching risk management to its people for years to save both lives and resources. In trying to summarize it, the benefit of an action must exceed its risk. There are some risks you have to assume based upon the situation, but if the benefit doesn't justify the risk, you shouldn't do it. Think about what you might lose and what you might gain. Then make a decision based upon all of the facts. For example, until the aviation community develops a small, low-cost aircraft with synthetic vision that permits visual flight in instrument meteorological conditions, a good risk management assessment would keep someone from trying to scud run in IMC weather to get home. The risk of a controlled flight into terrain (CFIT) accident, one of the greatest killers in aviation, would be avoided if the pilot realized the risk of a CFIT accident was too great and decided to wait out the weather if not IFR rated and current. The price of a night in a motel is cheaper than a fatal accident. It is your flight. It is your responsibility as PIC to have a safe flight. How you determine your flight risks determines your future. As a current television commercial says when it ends...It is your future: Be there.

Tales of an ASI

by Al Peyus

Summer is Gone!

So? It always happens about this time of the year! What does that mean to you? Well, guess what comes with the fall months. Yep! Our friend (or foe) IFR! The instrument conditions that can catch all of us unprepared if we wait until the first foggy day or low ceiling cold front to hit.

Summer flying had its own problems. Density altitude, poor engine performance, longer landings, less payloads, and hazy VFR days. The nice thing about fall is the clear air with sharp visibility when the fog or clouds don't get in the way. The bad thing of fall is the poor visibility in fog, low ceilings, IFR or low IFR conditions, icing conditions, contaminated runways, and the pilot's nemesis the embedded thunderstorm.

So, what are you going to do about getting ready for this interesting time of the year? Let's take a look at what is needed to prepare ourselves for this exciting and challenging time of the year to fly.

First things first. How is the aircraft? Here is a starting list of inspections/services that need to be current for the IFR flying coming around the corner. By all means, this is not the final and all encompassing list. Your aircraft may have additional needs not listed.

Pitot/Static System - The pitot/static system has a pressure check that is needed every two years to make sure it is working as required. Remember what it does for us? If the system is not working right, our airspeed, altimeter, and vertical speed indicators would fail to give us proper and accurate information. Make sure the aircraft logbook is current and the entry correct.

Altimeter System - The altimeter has its own special check. The aneroid wafers inside need to be checked for proper calibration to assure the altitude it is providing is correct. That requires a bench test in conjunction with the pitot/static system test. Again, another logbook entry, usually with the pitot/static entry, is made.

ELT battery - The ELT battery must be changed every half-life or when transmitter has been in use for more than one cumulative hour or see 14 CFR §91.207(C)(1)(2). It all depends on the manufacturer. The battery date for replacement must be legibly marked on the outside of the transmitter, in addition to being a logbook entry. Please check it. Remember how and when you can make sure it works? Every on-the-hour to five minutes after the ELT can be turned on to test it. The aircraft radio needs to be on and tuned to 121.5 and the speaker on. The 121.5 MHz ELT is allowed to emit three sweeps for testing. See your 406 MHz unit's testing limitations.

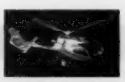
Radar/Storm Scope - The radar/storm scope may need a checkup to make sure it is still doing the job it was intended to do.

Cabin Heater - The cabin heater is a real big one! Too many people have come to a short end because of a faulty heating system. First, does it still work? The biggest problem is the exhaust system to the heater. Carbon monoxide poisoning is a silent, tasteless, odorless, colorless, and deadly gas. It sneaks up on pilots and passengers and slowly ruins your entire day! Only your friendly mechanic can tell you if all is well and proper with it.

Engine Exhaust System - The engine exhaust system has the same problem as the heater exhaust. It can put a deadly gas into the cabin where it is most certainly not wanted or needed. Again, your friendly mechanic is the perfect person to inspect the system.

Window De-fogger System - While the mechanic is inspecting your aircraft exhaust system, have him/her look at the cabin defogger system. When the fog is heavy and cold, we turn on our heating system. We even exhale warm air in the cabin. All this heat and moisture causes the windscreens to fog over. What a lousy time to find out the defogging system does not work!

De-Ice Boots - For those lucky enough to have an aircraft with de-ice boots, they also have another inspection to do. This they can do on their own. During a normal run-up for takeoff, test your boot system and watch what happens. If one or more sections do not inflate, now you get to go back to that friendly mechanic and have the boots patched or, heaven forbid, replaced.



Tires - What about the tires? They are good! They have air in them! So, you ask? Well, how is the tread? The same rule-of-thumb using the nickel still applies. If the tread does not reach the head, it is time to change the tires. With fall comes rain, snow, ice. The tires need tread to have controllability on contaminated runways. Without good tread to disperse the water and make contact with the runway, all we do is slide.

Magnetic Compass - When was the last time you had your magnetic compass swung? It is such a little thing. It always sits there in front of us. But, new equipment, changes in the interior of the aircraft, age, and even new paint can cause a magnetic draw that changes the accuracy of your compass. It takes less then an hour for your mechanic to go to the compass rose, swing the compass, and print a new card.

VOR Check - When was the last time you made the check and logged it? Remember it must be done every 30 days to be used for IFR flight. It is easy to do. You even have a choice of several methods.

1) VOT check. This can be done either on a shop bench or in the aircraft. For the aircraft check, find an airport that has a VOT check. It will be listed in the *Airport/Facility Directory*. Remember, it is "180 To and 360 From." The CDI should center.

2) A VOR check point on the airport. Some airports have a VOR check point on field that has a clean reception area and a known radial you can check. Again, it is noted in the *Airport/Facility Directory*.

3) With a dual VOR system, checking one VOR against the other is still available to you. This can be accomplished on the ground or in the air. It is accomplished by selecting a radial and tuning both VORs to that radial. Then, just note the differences.

4) The last is the airborne check over specific landmarks on a certified VOR radial in the immediate vicinity of the airport.

Remember the allowable differences? Ground checks are plus or minus four degrees and the airborne checks are plus or minus six degrees. Between two VORs, the maximum tolerance is four degrees. To log the check, the date, location, type of check, and the difference must be listed. The big question is always where it must be logged. The regulation states only that it must be written and available to the pilot in the aircraft. That can mean a VOR logbook, a note pad, or even a piece of scratch paper. For a complete review of VOR testing, you can review paragraph 1-1-4, VOR Receiver Check, in the *Aeronautical Information Manual*.

Again, there may be other requirements for your aircraft that I missed. Be sure to check the *Pilot's Operating Handbook* or *Aircraft Flight Manual* to find additional checks required. If in doubt, talk to your mechanic. He/she truly is your friend!

What about your pilot needs? Just like the aircraft, the pilot needs a few checks and currency checks. What do you need to prepare yourself for the coming IFR weather? How current are you on instruments? Here is a perfect time to contact your local appropriately rated instructor. Not only can the CFI get you IFR current and competent for IFR flights, but bring you up to date on airspace, rules, TFR, and regulation changes. Now, let's look at the pilot needs.

First is the instrument scan. How is it? Is it still as good as it was? As with anything we have learned, if we do not use it, we lose it! A couple of hours with a CFI can do wonders for our talents and our confidence.

While still with that CFI, why not get the latest information on any changes that may have occurred to the National Airspace System in the local area and any additional areas that may be flown, such as TFRs.

Don't let the CFI go without discussing any changes to the local airport procedures and any local approach and arrival changes that may have occurred.

It is always better to find out the changes to the local flight patterns or procedures BEFORE we go up and test the system. The perfect person for that information is the local CFI who flies the area and uses the system all the time. So use him or her!

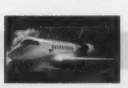
Flying can be so much more enjoyable when we are prepared for the activity before we start. Flying IFR can be tension-filled when every thing is working properly and we are familiar with all the procedures and airspace. When the surprises start coming at us like bolts of lightening, they will come, as Murphy's Law predicts, when we are already up to our waders in alligators. So why add to our blood pressure when it is not necessary. Simply planning and a little flight training prior to the hard weather will payoff in the long run. Besides, don't we always have fun being tested in controlled conditions?

Enjoy your flying and have fun with your CFI.

Al Peyus is an Aviation Safety Inspector in Flight Standards' General Aviation and Commercial Division.

FAA's 1-800-255-1111
Safety Hotline

FAA's Safety Hotline operates Monday through Friday (except holidays) from 8 am to 4 pm ET. It provides a nationwide, toll-free telephone service, intended primarily for those in the aviation community having specific knowledge of alleged violations of the federal aviation regulations. Callers' identities are held in confidence and protected from disclosure under the provisions of the Freedom of Information Act.



Who's In Command Here, Anyway?

By Jim McElvain

There was a very unfortunate, and tragic, fatal accident in our district recently, and I feel that it occurred because there was no one in command of the aircraft. A number of poor decisions were made initially, and the pilot's fate was sealed when indecision led to an aircraft with no pilot-in-command (PIC).

The day of the accident was a miserable instrument meteorological conditions (IMC) day in the Dallas/Fort Worth Metropolitan area. The best conditions were in the range of one and a half to two miles of visibility and a ceiling of 200 feet. A persistent drizzly rain had fallen all day. Operations continued at all of the larger airports, with instrument landing system (ILS) approaches leading to successful landings.

The airport at which the fatal accident occurred had only a non-precision approach, with a minimum descent altitude (MDA) in the neighborhood of 700 feet AGL. The approach brought the aircraft in from the west, and required a circle to the north/south runway. The aircraft, a Beechcraft *Bonanza* A-36, was well equipped and certified for IFR and had an IFR GPS. The pilot was appropriately rated and familiar with the aircraft.

Poor decisions began early in the approach. Really, the poorest decision was to attempt the approach in the first place. The 200-foot ceilings, an MDA of 700 feet, and a guaranteed circling approach did not bode well for success. As the approach commenced, the pilot stated that he was going to make one attempt and, if it resulted in a miss, he wanted to return via direct to his home field in west Texas. No missed approach procedure was assigned, and the pilot did not request one except for the wish to return direct to his home. The pilot was cleared for the approach and allowed to contact the local UNICOM for advisories. A short time later the pilot came back up on the approach frequency, declared a missed approach, and waited for missed approach instructions. The controller issued a left turn and a climb to 3,000 feet, but gave no heading. A game of 20 questions then began with the pilot asking for headings, and the controller asking whether the pilot had the equipment to go direct or not. About three questions into the game, the aircraft struck the ground in a steep nose-down attitude at a high rate of speed.

Why did the pilot attempt the approach in the first place? Considering the weather, shouldn't he have had a

missed approach procedure confirmed and "spring loaded" before initiating the approach? Was the pilot attempting to program a direct course to his home base while turning and flying at MDA? Why didn't the pilot just take command, climb, turn in the general direction of the direct course, and notify ATC of what he was doing?

I recall another accident scenario detailed in a controlled flight into terrain (CFIT) accident program produced by the Flight Safety Foundation. The aircraft was a very sophisticated business jet flown by a U.S. crew. The approach and landing was to be made to an airport in a non-radar environment, and the controller did not speak English as a first language. Charts showing the procedure and associated terrain were available and in use by the crew. The approach required a turn to the southwest after crossing a VOR, with a let down over the water and a procedure turn which would head the aircraft northeast towards the airport. The first officer handled the communications as the aircraft proceeded with the approach, but the language barrier between the controller and the crew led to confusion right away. The controller told the crew to begin descents to specific altitudes "south" of the VOR. The crew questioned each other again and again as to what the controller was asking for, but they continued to descend on a heading of 180 degrees "south," instead of flying the southwest route depicted on the chart. Finally, the PIC stated something to the effect of, "I'm not liken' this, I'm climbin' this sucker outta here!" Unfortunately, as the crew applied the power and started a climb, they struck a mountain just below its peak killing all aboard.

One questions why an experienced crew would press on without clear communication. With a chart depicting terrain in front of them, why did they continue to descend without following the published procedure? Why didn't one of the crew take command and avert the disaster?

A final incident is personal, and fortunately did not result in a fatal accident. Early in my flying career, with a private certificate and very little actual instrument time on my instrument rating, I was flying my wife and infant son to visit my wife's sister in McPherson, Kansas. Low ceilings and ice in the clouds prevented the non-precision approach to McPherson, so my plan was to execute the ILS at Hutchinson, Kansas. The approach was in a non-radar environment and involved an arc to the localizer course. The controller was doing his best to get me to an initial approach fix, but my lack of experience and knowledge combined with a wealth of apprehension caused by the ice and weather was preventing any meaningful communication. My apprehension was turning to a state of panic, and I had lost any ability to follow the controller's suggestions. Finally, motivated by fear and desperation, I told the controller what I was going to do. I wasn't smart enough to determine what he wanted me to do, but I knew how to go to the VOR, pick up a radial to the arc and fly it around. The controller was probably thinking, "It's about time that idiot figured something out!" The rest of the approach, with the exception of loading a little ice, was uneventful. A little luck, and a lot of fear, saved my bacon! Only a little extra time and altitude prevented disaster.

Why was I so late in seizing command? Shouldn't I have communicated my confusion and lack of experience earlier?

Each of these three scenarios contained confusion or misunderstanding, which lead to a loss of command. One was due to expectations that were never met, while another was caused by a difference in languages. The third was due to lack of experience or knowledge and a reluctance to convey that to Air Traffic.

The first scenario seems to indicate that the pilot abdicated his duty as pilot in command and attempted to place it in the hands of the controller. Whether this was due to improper training or past experience is not known. When the communication broke down, however, the pilot should have remained in command. He wasn't getting what he wanted, but he knew he needed to climb and keep control of the aircraft. The pilot is the final authority. You must have a plan, take action, and remain in command of the flight!

The crew of the business jet had failed communication due to language barriers, but the same principles apply. Maintain situational awareness, have a plan, and—if things aren't adding up—make a command decision to alter what is going on to keep the flight safe!

Why didn't I speak up sooner and let the controller know that I was a freshman and did not know how to do what was being asked? Again, only luck prevented my demise!

We all began our flying experience on the bottom rung of the ladder. Controllers, commercial pilots, instructors, and other experienced pilots seemed to know exactly what was going on, and it was difficult for us to take command at our fledgling level. With experience and proper training we pilots should, and must, quickly move out of this stage. We should always have a plan for the next segment of the flight (stay ahead of the airplane). When things don't appear to be going as they should, and that old uneasy feeling begins to creep in or you are just plain scared, command the aircraft! Announce, as necessary, what you are going to do and do it! And, a large part of being in command is conveying to others what your situation and intentions are. Keeping others in the loop can help to prevent getting yourself painted into a corner from which it will be difficult to escape. So, whether it is instrument approaches, weather, fuel, equipment failure, airspace, questionable position (pronounced "lost"), or any other problem, let others know early, get all of the information and help that you can, and act on the rational decisions you make. You are the pilot in command, the final authority, and you must not relinquish that duty.

Jim McElvain is the Operations Supervisor at the FAA's Fort Worth Flight Standards District Office.

Carbon Monoxide: A Hidden Danger in General Aviation

by G. J. Salazar, MD, MPH

The possibly mistaken belief that CO poisoning is rare could lull unsuspecting pilots to their deaths.

Carbon monoxide (CO) poisoning is one of those little-thought-of aviation safety issues. The incidence in general aviation is unknown, but when it does occur it could have significant consequences for aircraft occupants. Fortunately, it is preventable.

Carbon monoxide is produced by the incomplete combustion of carbon-containing materials. Aviation fuels contain carbon; therefore, expect CO whenever an engine or other fuel-burning device is operating. Even though piston engines produce the highest concentrations of CO, turbine engines could still be a significant source.

Carbon monoxide is truly a hidden danger because it is a colorless and odorless gas. However, because it is a byproduct of combustion, it is frequently associated with other gases that do have an odor. By leaving an environment with known exhaust fumes, an individual can avoid CO exposure. Problems usually occur when exposure is gradual or CO levels far exceed other gases in a mixture and a person does not realize a problem exists. Often, exposed individuals become confused or incapacitated before being able to leave the contaminated environment. When this happens in an airplane, the invariable end result is an accident.

Is CO Poisoning a Problem in Aviation?

Depending on who is asked, carbon monoxide poisoning in general aviation may or may not be considered a problem. Several studies have confirmed that fatal aviation accidents related to in-flight CO contaminated aircraft interiors are rare. However, non-fatal CO poisoning in aviation is likely a more common occurrence than currently believed. No one is sure how many times pilots or passengers feel ill and do not realize they have been exposed to CO. Because no significant incident or incapacitation occurred, the matter is not reported and, hence, not investigated. Symptoms that could be attributed to airsickness, altitude hypoxia, fatigue, or a variety of other conditions could, in fact, be CO poisoning. Exposure and symptoms may occur repeatedly over several flights until finally someone suspects CO exposure or, tragically, a fatal accident happens. At present, no database exists that accurately collects or tracks non-fatal aviation CO exposure information.

Death in an aircraft accident is a readily identifiable end-point that is extensively studied from technical and human factors perspectives. Feeling ill is not as striking an event; therefore, the magnitude of CO poisoning in general aviation may never be fully ascertained. Yet, the possibly mistaken belief that CO poisoning is rare could lull unsuspecting pilots to their deaths.

Aircraft Environmental Systems

The potential for CO intoxication in most general aviation airplanes comes from the process utilized to heat the cabin. The majority of these airplanes will have either a combustion heater or an exhaust-manifold heater. Of the two methods, the latter is most commonly encountered in single-engine, piston aircraft, primarily because it is a simple, inexpensive, and effective design. A portion of outside air entering the aircraft ventilation system is forced into a shroud that surrounds the engine exhaust manifold. Convective heating of the air surrounding the sealed exterior of the manifold occurs, and ducting then transfers the air into the cabin. Cabin occupants set cabin temperature by regulating the mixture of heated and unheated air.

Combustion heaters, on the other hand, are more complex, expensive, and heavy. For these reasons, they are typically found in multi-engine aircraft. This type of device produces heat by burning fuel in a sealed chamber. External air is vented over or near the sealed combustion chamber, again heating the air by convection, and the heated air is then ducted to the cabin.

Aircraft manufacturers go to great efforts to ensure manifold exhaust and combustion chamber systems are sealed and isolated to prevent fume leakage. Unfortunately, any defect could permit CO and other exhaust gases to combine with the air used to heat and ventilate the cabin. Obviously, wintertime flying presents the greatest risk, since pilots and passengers try to stay comfortable, perhaps unwittingly permitting CO to enter the cabin when they turn on cabin heat. CO contamination could be a factor at any time of the year, however, if defects exist in the airplane's structure or heating system.

Another possible source of CO contamination is an in-flight fire. Fortunately, this is a rare occurrence and leads any pilot to take immediate emergency action by landing as quickly as possible. However, if the smoke production is significant and/or

a delay in landing occurs, blood levels of CO and other toxic substances may rise very quickly and incapacitate cabin occupants.

Mechanism for Toxicity

Carbon monoxide has a very high affinity for hemoglobin, the molecule in blood responsible for oxygen transport. This affinity is about 240 times that of oxygen, causing CO to tightly attach to hemoglobin, thus creating the compound carboxyhemoglobin (COHb), which prevents oxygen from binding, hence blocking its transport. The result is hypoxia but through a mechanism different from that produced by altitude but with symptoms and end-effects that are very similar to those caused by hypoxia.

There should be little or no CO in the blood of individuals who have not been exposed to smoke or other by-products of combustion. People living in polluted urban environments will have 3-10% COHb concentration because of the CO in the smoke and fumes they inhale. Cigar or heavy cigarette smokers could have 7-10% COHb. People in certain occupations (foundry workers, welders, mechanics, firefighters, and tollbooth or tunnel attendants) who are exposed to products of combustion may also have elevated baseline levels.

Symptoms

The approximate blood concentrations of CO needed to produce the most common symptoms of exposure are shown in Table 1. Note that these symptoms are for an individual with normal hemoglobin at sea level. Expect that symptoms could be worse and/or appear sooner than they otherwise would at altitude. Wide personal variation in symptoms also occur.

Protection From CO Exposure

Pilot education and awareness are the most important tools in preventing exposure to CO. Pilots must understand the danger posed by CO poisoning and should be alert to the symptoms. Any unusual cabin smell or symptoms listed in Table 1 should call for immediate troubleshooting and decisive action, including identifying the closest airport to which to divert. Cabin heat should be turned fully off. The rate of cabin fresh air ventilation should be increased to the maximum. If available, and not a safety or fire hazard, consideration should be given to the use of supplemental oxygen.

However, unlike altitude hypoxia, symptoms will not immediately improve with oxygen. Poisoning by CO may require more than oxygen to treat; however, by using a mask with a tight seal, a person may minimize further exposure. The pilot must land as soon as possible and, if necessary, ask for air traffic control help for vectors to the nearest airport.

Once on the ground, medical attention should be sought because, depending on the degree of CO exposure, more aggressive treatment may have to be initiated. Finally, a certified mechanic should thoroughly inspect the airplane before it is flown again.

The best protection against CO poisoning is to avoid exposure. Aircraft owners, operators and pilots must ensure that heating and exhausts systems are in good working order, per manufacturer and FAA specifications. Certified mechanics must conduct all required inspections. Special attention should be paid to older aircraft because of corrosion or simple wear and tear of components. Firewall and aircraft structure should be verified and any defects sealed by a certified mechanic.

Several devices are available to monitor for the presence of CO. The least expensive are handheld or stick-on colorimetric devices that indicate the presence of CO by changing color. While these are effective, they are not without problems and need to be changed frequently to maintain accuracy. Powered detectors are also available in either portable or panel-mounted models. They are more expensive but are also more reliable.

Before using any particular device, the pilot should verify its use in aircraft is approved. Ultimately, pilot awareness of the risks and decisive action to prevent the causes are the best weapons to prevent CO exposure and ensure years of safe, enjoyable flying.

Dr. Salazar is the FAA's Southwest Regional Flight Surgeon. This article was reprinted from the Federal Air Surgeon's Medical Bulletin.

Table 1. CO Concentrations and Symptoms

% CO in Blood	*Possible Symptoms*
<10	*No symptoms*
10-20	*Mild headache, giddiness*
21-30	*Headache, slight increase in drowsiness*
31-40	*Headache, impaired judgment, shortness of breath, increasing drowsiness, blurring of vision*
41-50	*Pounding headache, confusion, marked shortness of breath, marked drowsiness, increase in blurred vision*
>51	*Unconsciousness, eventual death if a person is not removed from source of CO*

Aviation Maintenance Alerts

INTERNET SERVICE DIFFICULTY REPORTING (iSDR) WEB SITE

The Federal Aviation Administration (FAA) Internet Service Difficulty Reporting (iSDR) web site is the front-end for the Service Difficulty Reporting System (SDRS) data base that is maintained by the Aviation Data Systems Branch, AFS-620, in Oklahoma City, Oklahoma. The iSDR web site supports the Flight Standards Service (AFS), Service Difficulty Program by providing the aviation community with a voluntary and electronic means to conveniently submit in-service reports of failures, malfunctions, or defects on aeronautical products. The objective of the Service Difficulty Program is to achieve prompt correction of conditions adversely affecting continued airworthiness of aeronautical products. To accomplish this, Mechanical Reliability Reports (MRRs), Malfunction or Defect Reports (M or Ds), Maintenance Difficulty Reports (MDRs), or Service Difficulty Reports (SDRs) as they are commonly called, are collected, converted into a common SDR format, stored, and made available to the appropriate segments of the FAA, the aviation community, and the general public for review and analysis. SDR data is accessible through the "Query SDR data" feature on the iSDR web site at: <http://av-info.faa.gov/isdr/>.

A report should be filed whenever a system, component, or part of an aircraft, powerplant, propeller, or appliance fails to function in a normal or usual manner. In addition, if a system, component, or part of an aircraft, powerplant, propeller, or appliance has a flaw or imperfection, which impairs or may impair its future function, it is considered defective and should be reported under the Service Difficulty Program.

The collection, collation, analysis of data, and the rapid dissemination of mechanical discrepancies, alerts, and trend information to the appropriate segments of the FAA and the aviation community provides an effective and economical method of ensuring future aviation safety.

The FAA analyzes SDR data for safety implications and reviews the data to identify possible trends that may not be apparent regionally or to individual operators. As a result, the FAA may disseminate safety information to a particular section of the aviation community. The FAA also may adopt new regulations or issue airworthiness directives (ADs) to address a specific problem.

The iSDR web site provides an electronic means for the general aviation community to voluntarily submit reports, and may serve as an alternative means for operators and air agencies to comply with the reporting requirements of Title 14 of the Code of Federal Regulations (CFR) Sections 121.703, 125.409, 135.415, and 145.221, if accepted by their certificate-holding district office. FAA Aviation Safety Inspectors may also report service difficulty information when they conduct routine aircraft maintenance surveillance, as well as accident and incident investigations.

The SDRS data base contains records dating back to 1974. At the current time, we are receiving approximately 45,000 records per year. Reports may be submitted to the iSDR web site on an active data entry form or mailed to the address below. The SDRS and iSDR web site point of contact is:

John Jackson
Service Difficulty Reporting System, Program Manager
Aviation Data Systems Branch, AFS-620
P.O. Box 25082
Oklahoma City, OK 73125
Telephone: (405) 954-6486
SDRS Program Manager
e-mail address:
9-AMC-SDR-ProgMgr@faa.gov

Service Difficulty Reports

Control Number Difficulty Date	Aircraft Make Aircraft Model	Engine Make Engine Model	Component Make Component Model	Part Name Part Number	Part Condition Part Location
109052704 5/27/2004	AGUSTA A109			RELAY MS24166D	FAILED HYD SYSTEM

DURING ROUTINE SCHEDULED MAINTENANCE, IT WAS NOTED THAT THE HYDRAULIC UTILITY POWER PACK WOULD NOT SHUT OFF AFTER REACHING OPERATING PRESSURE. THE PROBLEM WAS TRACED TO AN ELECTRICAL RELAY. THE CONTACT POINTS WERE WORN AND HAD INDICATIONS OF METAL TRANSFER. THE RELAY WAS REPLACED AND SUBSEQUENT FUNCTIONAL TESTS OF THE SYSTEM WERE WITHOUT FAULT. AS A PRECAUTIONARY MEASURE, WE ARE TAKING STEPS TO REPLACE THIS RELAY THROUGHOUT OUR FLEET.

2004FA0000428 4/28/2004	BALWKS FIREFLY11		LINE 231311	INADEQUATE FUEL DIST

UPON INSPECTION OF VALVE LINE SEVERAL LOCATIONS WERE FOUND WHERE THE INNER KEVLAR LINE HAS BUNCHED UP AND BECAME EXPOSED THROUGH THE OUTER PROTECTIVE NYLON COVER. THIS WAS FOUND IN VARIOUS PLACES ALONG LENGTH OF LINE. EACH OF THE PEA SIZED EXPOSED AREAS HAVE ABRASION ON THE EXPOSED KEVLAR. THIS LINE WAS REMOVED FROM SERVICE.

AUS20040197 3/13/2004	BEECH 200BEECH	PWA PT6A41	BLADE	LIGHTNING STRIKE PROPELLER

(AUS) LT PROPELLER BLADE EXHIBITED LIGHTNING EXIT MARKS. FURTHER INVESTIGATION FOUND BOTH LT AND RT PROPELLERS MAGNETISED BEYOND LIMITS. LT ENGINE POWER SECTION MAGNETISM BEYOND LIMITS. LIGHTNING EXIT MARKS FOUND ON LT ELEVATOR OB TRAILING EDGE.

CA040426003 3/30/2004	BEECH B200	PWA PT6A42	WINDOW 1014301835	WARPED COCKPIT

(CAN) DURING A ROUTINE DAILY INSPECTION IT WAS NOTED THE RT AFT CABIN WINDOW HAD A INWARD CONCAVE APPEARANCE ACROSS THE CENTER FROM TOP TO BOTTOM. UPON REMOVAL WITH THE USE OF A STRAIGHT EDGE IT WAS WARPED ACROSS THIS AREA. NO FURTHER DEFECTS IN THE FORM OF CRACKING OR CRAZING WERE NOTED. INTEGRITY OF WINDOW PANE APPEARED NORMAL. THE WINDOW AND SEAL WERE REPLACED WITH NEW IAW B200 MM. NO FURTHER DEFECTS HAVE BEEN NOTED.

AUS20040155 3/3/2004	BELL 412	PWA PT6T3B	OIL 8538100	COOLER LEAKING ENGINE

(AUS) ENGINE/TRANSMISSION OIL COOLER INTERNAL LEAK. THE LEAK ALLOWED TRANSMISSION OIL TO ENTER THE COMBINING GEARBOX OIL SYSTEM UNDERPRESSURE AND OVERFILL THE COMBINING GEARBOX WHICH THEN VENTED THROUGH THE BREATHER.

2004FA0000407 5/20/2004	CESSNA 180	CONT O470*	CARBURETOR 45A10396512	WORN ENGINE

CARBURETOR STICKING AT FULL THROTTLE DUE TO WEAR OF THE FULL THROTTLE STOP. IT WAS ACTUALLY GOING PAST FULL THROTTLE. THE PUMP LEVER ASSEMBLY WOULD TURN PAST THE AIR METERING PIN AND HANG UP THE THROTTLE SHAFT IN WIDE OPEN POSITION.

The Aviation Maintenance Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products and can be found on the Web at <http://www.faa.gov/avr/afs>. Click on "Maintenance Alerts" under Regulations and Guidance. The monthly contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts' readers prompt notice of conditions reported via Malfunction or Defect Reports, Service Difficulty Reports, and Maintenance Difficulty Reports. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029.

• Kudos Corner

I don't remember the last time I read a government publication cover to cover! The *Aviation News* has been getting better and better—but I found your January/February 2004 issue extraordinary! *EVERY* article was especially informative, but not so informative as to put the reader fast asleep after the second paragraph!

The announcement of the New Air Traffic Organization reeks of the dawn of "privatization" to our outstanding ATC. As a perpetual instrument student and one of the fortunate few (pre 9/11) to have spent a day with the ATC during an Operation Raincheck—I hope "privatization" isn't so. Air Traffic Control does a remarkable job with their heavy-at-times workload. (At the same time, having such patience with marble-mouthed-can't-get-the-words-out instrument students, such as myself.)

My sincerest appreciation to all members of new airmen certificate! Such a work of art! Thoughtful and artistic! It may have, in part, been initiated in response to Barry Schiff's writings. But more importantly—the FAA "*understood*"—and understood well!

Looks like it's time to strive for a new rating—just to be the proud bearer of this ingenuous certificate! Keep up the good work!

Most appreciatively,

Phil Danskin
Articulated-Friese driver
Sonoma, CA

Thank you for your kind words. You should think of adding a new rating as not only one way to get a new certificate, but also as a great way to regain or maintain your flight currency. Although a new rating isn't necessary, the process is in place to replace the paper certificate. For more information view the Civil Aviation Registry web site at <http://www.registry.faa.gov>.

• And Another

Congratulations, this issue (July/August 2004) is awesome. Not to take anything away from the other recent issues either! What a showcase for general aviation.

Training and education are the keys to aviation safety and you have done a masterful job of characterizing the FAA's efforts in those areas. The FAA has many, many reasons to be proud of its work, but rarely gets good press coverage for its efforts. Even if it is the house publication, it will and should be widely distributed to our friends on the Hill (Congress) and throughout other government agencies as a wonderful example of positive reporting of meaningful safety measures. The magazine staff did a great job of capturing the leadership positions in many safety efforts by the FAA and industry.

Keep up the excellent work? It is a pleasure to be able to say that I once was a part of the FAA

Roger Baker
Via the Internet

Thanks for the compliments and you don't even have to give them now that you are no longer our boss.

The purpose of this issue was to show how general aviation is changing with advanced technologies and the critical role training and education plays in general aviation safety. We are glad you and our other readers enjoyed the issue.

• Web Site Format

For what it's worth, PDF is not special to us. It has severe accessibility limitations. We like your publication and would ask that you PLEASE not abandon HTML formats.

Patrick Thorne
Via the Internet

Thank you for your comments. As I explained in my introduction to both the magazine and the web site for the July/August issue, this was a special issue for us. The September/October issue will return to our normal format in both print and on the web site. Thank you again for sharing your concerns and comments with us. We appreciate your interest in the magazine and aviation safety.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

FAA ISSUES LICENSE FOR FIRST INLAND LAUNCH SITE

On July 12, the FAA announced it has issued a license for the first inland launch site in the United States at the Mojave Airport in California.

The FAA Office of Commercial Space Transportation issued the launch site operator license on June 17. The license authorizes East Kern Airport District (EKAD) to operate the launch site in support of suborbital reusable launch vehicle missions, as authorized by an FAA license, to take off at Mojave Airport.

"This license brands Mojave as new frontier of flight," said FAA Administrator Marion C.. Blakey. "The FAA will do its part, at every step of the way, to support the unlimited potential of safe commercial space transportation."

This action makes the launch site at Mojave Airport the fifth commercial spaceport licensed by the FAA. Other launch site operators who have previously received licenses are the Alaska Aerospace Development Corporation for the Kodiak Launch Complex; the Virginia Commercial Space Flight Authority for the Virginia Spaceport at Wallops Flight Facility; the Florida Space Authority for Spaceport Florida at Cape Canaveral Air Force Station; and Spaceport Systems International for California Spaceport at Vandenberg Air Force Base.

The launch site operator license authorizes the spaceport for five years from the effective date of the license.

NEW ONLINE SERVICES FOR AIRMEN

U.S. airmen who lose their certificates accidentally can get back into the air more quickly than in the past, thanks to a new and expanded service of the FAA's Civil Aviation Registry.

Replacement certificates and temporary authority to operate can be requested through an online services account on the FAA Civil Aviation Registry web site, <http://registry.faa.gov>.

"These new options allow airmen to receive, by fax or e-mail, temporary authority to operate in the event a certificate has been lost or destroyed and they need to operate an aircraft immediately or within 14-days. They are also able to request and pay for a replacement certificate online," said Mark Lash, manager of the FAA Civil Aviation Registry.

Current online services include renewing of reserved "N" numbers, requesting copies of aircraft records, and changing addresses for airmen.

FAA's Civil Aviation Registry in Oklahoma City manages and operates the national records system and database for FAA airmen certificates and the legal content of all airman certification records. The Registry also is responsible for the regulations and systems associated with the registration of U.S. civil aircraft.

Registry systems provide information to FAA aviation safety inspectors, National Transportation Safety Board investigators, and law enforcement agencies to support aviation safety activities.

UPDATE ON THE LOA/LOOA PROGRAM

Airmen who currently hold Letters of Authorization (LOA) and Letters of Operational Authority (LOOA) now have until July 31, 2005, to exchange those letters for an airman certificate with the appropriate aircraft authorizations. Just before the original July 31, 2004, deadline the FAA encountered a significant backlog processing airman files for the exchange of LOAs and LOOAs.

Initially, a decision was made to extend the July 31, 2004, deadline for an additional 90 days. This extension allowed those airmen who had applied for the exchange of their LOA or LOOA to continue to operate using their current LOA and instructing using their current LOOA while waiting for their new airman certificate(s). After further consideration and in an effort to reduce the public burden and impact on the aviation community, the FAA decided to extend the originally deadline date by a year. Airmen who hold a valid LOA or LOOA have until July 31, 2005, to use and exchange an LOA or LOOA for an airman certificate with the equivalent authorized aircraft listed. After July 31, 2005, an LOA or LOOA is no longer valid and will not be reissued as an authorization on an airman certificate. Airmen who do not possess an LOA will be able to have an aircraft authorization added to an airman certificate when they complete the appropriate training and a flight evaluation.

LOOA holders may continue to provide training until July 31, 2005. However, LOOA holders may no longer make a required recommendation or endorsement for a new applicant for an "Aircraft Authorization." Only an Authorized Instructor (AI) is permitted to make a required recommendation or endorsement under this program. LOOA holders are encouraged to convert their LOOA to an AI certificate as soon as possible.

Pilots desiring to convert their LOA/LOOA should submit FAA Form 8710-1, Airman Certificate and/or Rating Application, and paperwork directly to AFS-800. The application must have attached to it legible copies of the applicant's pilot certificate (front and back), medical certificate (must be current), valid driver license, and current LOAs/ LOOAs. Pilots holding an LOA/LOOA with all makes and models of high performance piston-powered airplanes must submit a copy of the logbook pages or other records that show their aircraft checkout and time as PIC in each type aircraft for which authorization they are applying. The package must be notarized and

mailed to the following address:

FAA Flight Standards Service
General Aviation and Commercial Division, AFS-800
Attn: LOA/LOOA
800 Independence Avenue, SW
Washington, DC 20591

AFS-800 will process the application and mail a copy of the temporary pilot certificate to the applicant reflecting applicable Authorized Experimental Aircraft Ratings. AFS-800 will forward all application packages to the Airman Certification Branch, AFS-760 for further processing and issuance of the permanent pilot certificate.

All new applicants for an "Aircraft Authorization" are required to receive training and obtain an endorsement (recommendation) from an AI for that specific aircraft. This training must be in accordance with an FAA accepted training program. LOOA holders may continue to provide this training; however, LOOA holders may no longer make a recommendation or endorsement. After receiving a recommendation from an AI, the applicant should contact an EAE for a practical test. After successful completion of the practical test the EAE will add the new aircraft authorization to the airman's certificate.

AFS-800 is working with the aviation community to address any issues related to reviewing and accepting industry developed training programs and ensuring that qualified EAEs are available.

FAA NAMES HEADQUARTERS BUILDINGS AFTER WRIGHT BROTHERS

For over 40 years, employees of the FAA have known the two headquarters buildings in Washington, DC, as Federal Office Building (FOB) 10-A and FOB 10-B. As a "thank you" to two brothers, who turned a dream of flight into reality, FOB 10-A has been re-named the Orville Wright Federal Building and FOB 10-B is now the Wilbur Wright Federal Building.

FAA Administrator Marion C. Blakey (l) and Secretary of Transportation Norman Y. Mineta (second from left) lead the dedication ceremonies.

The ribbon-cutting ceremony for the re-naming of the two buildings took place on July 6, a sweltering hot summer day. But even as hot as it was outside, it was the perfect day to honor the Wright brothers—clear blue skies and sunshine. Many dignitaries were in attendance for the ceremony including past FAA Administrators, present Administrator Marion C. Blakey, Secretary of Transportation Norman Mineta, and Congressmen Robin Hayes (NC) and Mike Turner (OH). Also in attendance was a very special guest representing the Wright family, Amanda Wright-Lane.

Administrator Blakey, mistress of ceremony, spoke of how far the aviation world has come since the Wright brothers' first flight. She also introduced to the audience, the FAA employee who suggested to her that the two buildings be named after the Wrights. Jerrold Sandors was on an elevator with Administrator Blakey one evening when he made the suggestion. Many may have had the same idea, but Sandors was on the right elevator at the right time. When Administrator Blakey told of the story, she said that re-naming the two buildings was, "just the right thing to do."

Congressmen Hayes and Turner co-sponsored a bill to name the FAA buildings after the Wright brothers. They explained that, when they introduced the legislation to name the buildings, it was clear that Congress would pass the bill quickly. To ensure media coverage, the two engaged in good-natured repartee—each claiming greater bonds with the Wright brothers. Hayes went so far as to vote against the bill, gathering media attention on the initiative. In the end, President George W. Bush signed the legislation into law on April 30.

Secretary Mineta spoke briefly about the Wright brothers' accomplishments and how they were the start of where we are in aviation today. He concluded by saying, "The names carried by these two buildings--the Wright brothers buildings—are not only a lasting statement of our Department's commitment to America's international leadership in aviation, they are also a lasting statement of our country's overall traits of optimism, vision, inventiveness, and bold exploration. Traits that are synonymous with the Wright brothers' name."

Editor's Runway

from the pen of H. Dean Chamberlain

ONLY IN AMERICA

It can only happen in America. Where else in the world, for example, can an automotive manufacturer sell you an overpriced vehicle, then make you feel good by giving some of your own money, which you probably had to finance, back to you in the form of a rebate. Have you ever wondered why the companies just don't add up the cost of manufacturing and selling the vehicle and add in a reasonable profit? But, no, the companies found out decades ago that customers are willing to accept inflated prices hoping for a rebate. I once remember sitting in a marketing class in college where we discussed the marketing strategies of inflating prices to develop a higher pricing mind set in customers, and the use of coupons and rebates to reduce the actual price of products while keeping the inflated pricing structure. The idea being some customers are gullible and will pay the inflated price while others will try to "negotiate" a lower price. Then if you eliminate the rebate, you effectively have a price increase without "raising" prices. In the end, some people are happy with their rebates thinking they got a good deal. For those who didn't get one, they are left wondering what happened.

Such was my reaction as a registered aircraft owner to a letter I received recently from a major aerospace manufacturer. I am still wondering what happened. The letter concerns vacuum systems in single-engine aircraft. As background, the company was recently involved in a major lawsuit involving its vacuum system products. As a result, the company was ordered to pay out several million dollars. It is my opinion, and I stress my opinion, the letter I received was a direct result of the litigation.

However, like I felt when I bought a new car in June, I am still left wondering what happened. The letter had two parts. One part contained what the company claimed were mandatory inspection and replacement requirements for its vacuum system related products. I can understand why the company wants its products inspected and replaced on a specified basis. The company wants to avoid another lawsuit. By specifying both hours of operation and installation years, the company is building a future defense while avoiding or minimizing its risk exposure.

But the second part of the letter left me wondering why I have an airplane. More specifically, why I have an instrument rating. The letter recommended that IFR capable, single-engine aircraft without a backup vacuum system only be flown in day visual flight rules (VFR) weather conditions. Its recommendation effectively removes the transportation value of such aircraft. More importantly, it also negates the value of having an instrument rating. As part of its justification, the company stated in many cases (in my own words) pilots lack the training and proficiency to safely fly partial-panel in instrument meteorological conditions (IMC), hence the day-VFR recommendation.

Since not every single-engine nor all twin-engine aircraft have a backup vacuum system, I think pilots of such aircraft need to maintain instrument currency and more importantly maintain proficiency in partial-panel instrument flying. Alternatives include adding some type of backup system such as an electric attitude indicator or one of the manifold backup vacuum systems or as the letter recommends, only flying in day-VFR conditions.

The choice is yours, but like rebates and buying a new car, sometimes it is difficult trying to decide whether to take the rebate or the reduced interest rate. You know someone is making money on you, but you don't know how. Such is flying with a single vacuum system. There are risks involved in any flight; the question is what is the best way to minimize those risks. A well-maintained aircraft is the first step. The second step is a proficient pilot able to fly partial panel to minimums. I also think a well-trained and proficient pilot with minimal onboard equipment is better (safer) than a marginal pilot with redundant equipment the pilot doesn't know how to use.

The choice is yours. But since there may be hundreds, if not thousands, of single-vacuum system aircraft flying safely in potential IMC everyday, if you are the pilot of one of those aircraft, you don't want to be left wondering what happened when your only vacuum system fails. So, if you are not sure of your partial-panel proficiency, call your local flight instructor and schedule some additional training today.

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